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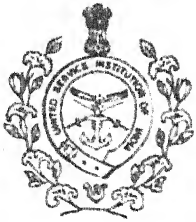

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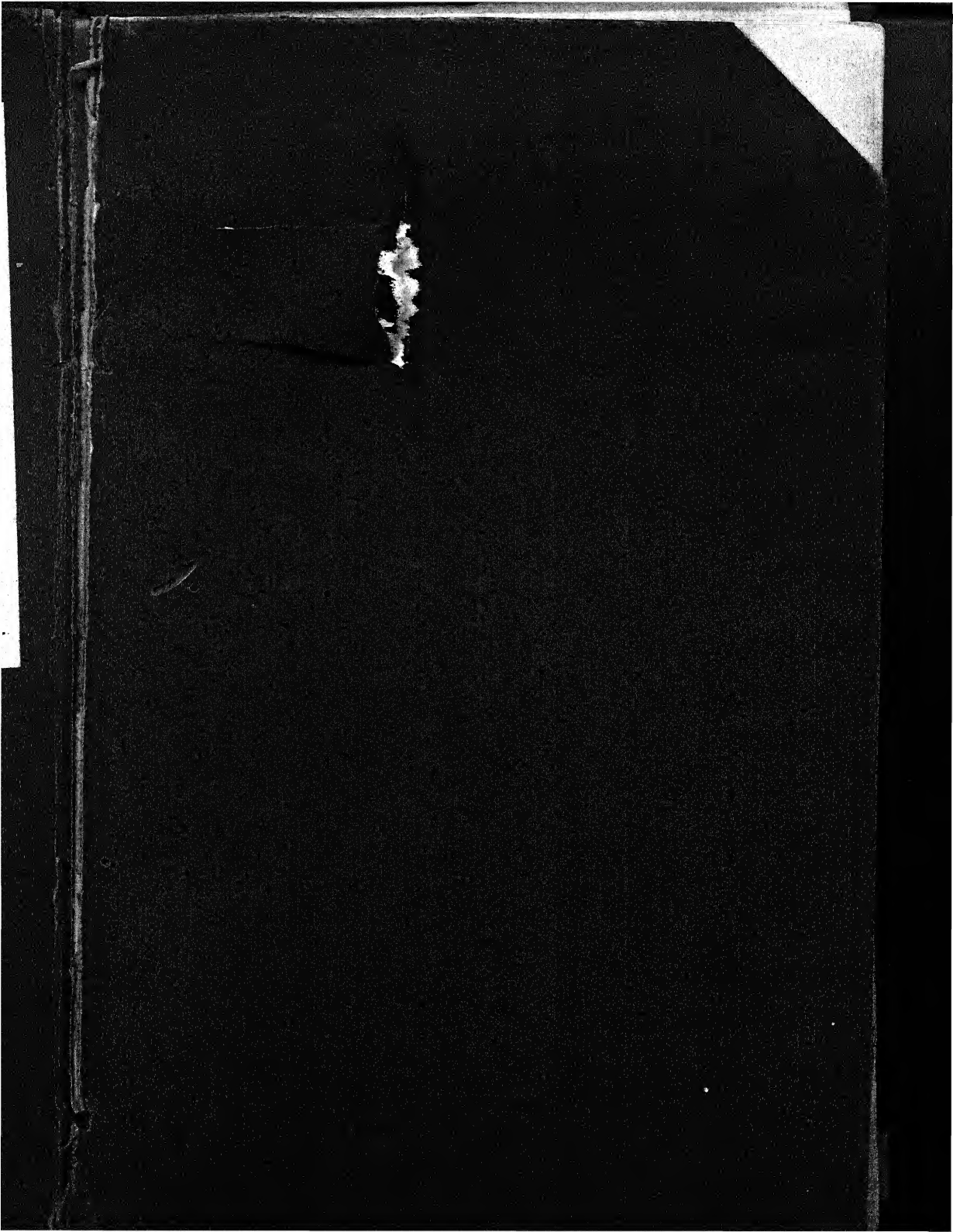

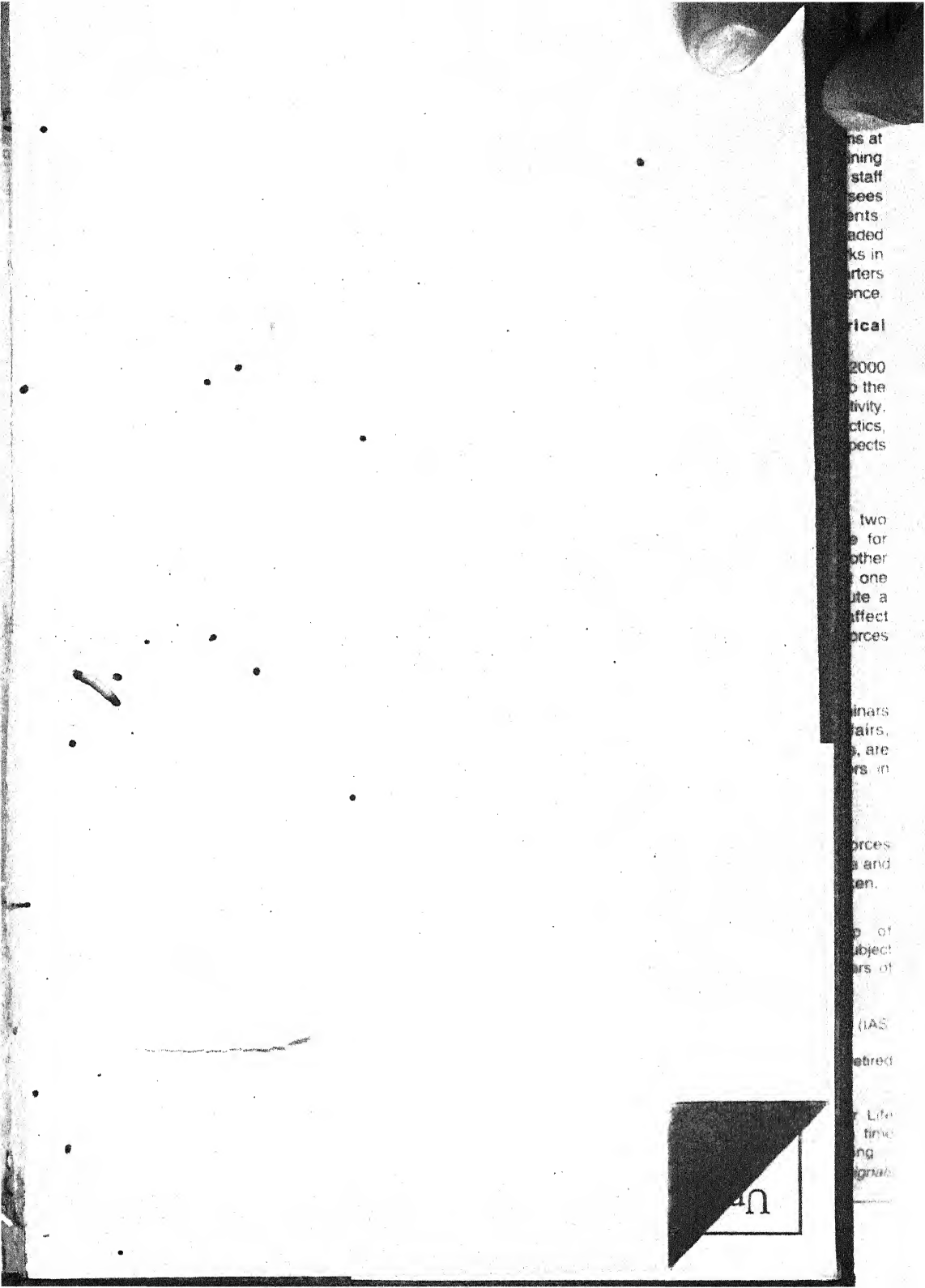

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THE INFLUENCE OF FIREARMS UPON TACTICS.

"HISTORICAL AND CRITICAL INVESTIGATIONS BY AN OFFICER OF SUPERIOR RANK."

TRANSLATED FROM THE GERMAN

BY CAPT. E. H. WICKHAM, R.A.

HENRY S. KING & CO., LONDON.
1876.

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PREFACE.

THE object of the accompanying little work is to represent the tactics which came to light in the campaign of 1870, in their relation to the past. The intention is not to avoid considering these tactics individually, as well as the manner in which the individual arms were used, and their co-operation to obtain a common object, but all details with regard to constitution, regulated forms, armament, and fighting relations, which do not refer immediately to the guidance of a battle, have been avoided.

The criticisms on the battles which have taken place must be referred to for information on this latter subject, and by this means those points of view which have to be considered thereby will be made clear, at the same time some interest will be awakened as to what has taken place in times long past, for military literature has neglected this beyond measure.

It is undoubtedly interesting to follow up; how it was predominantly cannon which brought modern infantry into existence in opposition to an imposing cavalry; how small-arms then completely assumed the lead, and determined both the methods as well as the forms of fighting; the influence which the guns finally exerted on the latter, but how for the first time in the last war they exercised an influence which may be said to have carried everything before it, owing to the combination of accuracy, range, and complete command of the most different natures of *terrain* by the most extensive use of shells. It is the object of this little work, in addition to reviewing the whole past of the tactics

of firearms, to lay down the maxims for a not too remote future, and is therefore far from being a mere pamphlet, or a polemic against writings which bear reference to the last war.

The groundwork of this *brochure* has been filled in, in a manner peculiar to itself, from the fact that the first sections were written immediately after the Crimean war, and were only altered so far as appeared necessary to make a continuous whole out of them. The writing has consequently this advantage, that it has not been written under the influence of the present; that it demonstrates most emphatically the prominent influence which literature has exercised upon the art of war, but also the triumphant revolution which practice has brought about in contravention to a one-sided theory which had been developed; and shows, finally, how even the important alterations which have taken place in the various arms since 1855, have exercised very little influence upon the general principles of the manner in which troops are to be led.

THE AUTHOR.

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INFLUENCE OF FIREARMS UPON TACTICS.

PART I.

FROM THE PERIOD BEFORE THE INTRODUCTION OF RIFLED ORDNANCE.

1. *PROGRESS OF THE DEVELOPMENT OF MODERN TACTICS FROM THE INTRODUCTION OF FIREARMS UP TO THAT PERIOD WHEN RIFLED FIREARMS CAME INTO GENERAL USE.*

(*a.*) UP TO THE STRUGGLE FOR INDEPENDENCE, 1813–15. AN HISTORICAL SKETCH.

Fourteenth and Fifteenth Centuries.

AT the time when we find that firearms were first introduced—during the first half of the fourteenth century—the knight reigned supreme on the battlefield. Nevertheless, during the course of the Middle Ages, the value of the infantry soldier had come to be felt, under certain favourable conditions, however, and only amongst individual nationalities, but infantry could never succeed in carrying on a struggle of any duration with the knights and soon disappeared from the scene; besides which, the latter disdained to fight side by side with them. It was even considered derogatory for a knight to make use of bow or crossbow when fighting. The English knights, however, were an exception to this. As the bands of archers were on foot, but were never-

theless incapable of independent tactical employment, their union with the cavalry presented great difficulties, the English knights therefore found themselves compelled to fight on foot.

It is to this method of fighting, as well as to their discipline, that they were indebted for the results which they obtained in the French and English wars. From that time onwards, mounted archers and crossbowmen were continually being augmented in Germany, and after the great Burgher wars (1388) it was a habit of the knights (who were spearmen) to attach two infantry soldiers to themselves, as well as their troopers, one of whom was a bowman, the other a pikeman. It was, however, only in exceptional cases that a knight dismounted to fight on foot, although this custom had been in vogue from the earliest Middle Ages.

The French knights, on the other hand, were instructed to dismount and fight on foot, as it was impossible when mounted to break through the palisades formed of wooden stakes shod with iron, behind which the English intrenched themselves. It may not, however, have been owing to class prejudice alone that such great difficulty arose with regard to the formation of an infantry which would be capable of independent action. In Germany every condition was at hand for the creation of an excellent infantry, and the powerful rivalry which arose between the knights and the civic element, and which led to arms being taken up in the second half of the fourteenth century, would of necessity have created an infantry force had it been at all possible.

Moreover the knowledge of our ancestors had so far advanced that it was well known what an effective infantry force meant. But the heavily-armoured knight, the exclusive soldier of the Middle Ages, with his military education, the whole end and aim of which was war and intestine feuds, exercised an ascendancy over the infantry to an extent that had never been equalled. Some new element was required in order that an infantry force could make headway, and this new element was artillery.

It was at the beginning of the fifteenth century that the

firearm had made such progress, owing to the increased length of the barrel, and to the invention of a proper framework on which it might be manipulated, that it was capable of delivering a direct fire. Hitherto it had been necessary to have recourse to curved fire even with the weapons discharged by hand. The names *Tarras Rifle* and *Veuglaire*, from which stone-shot and subsequently leaden balls were fired, which sprang into existence at the beginning of the fifteenth century, at the same time as the hand-gun known as *Couleuvrine*, are an evidence of this progress; and a tactician arose in Ziska, who knew how to turn this weapon to advantage in a tactical manner peculiar to it.

He caused the rampart made by the wagons and carriages, *Wagenburg*, which until now had always been placed in rear of the line of battle formed by the knights, to be brought into the first line of battle, furnished it with a great number of these hand-guns, and also laid in a large stock of mortars (*haufnitzen*), for vertical fire. Ziska adopted this plan of fighting from the Belgian cities, by whom it had been much employed during the fourteenth century. Considering the condition of firearms during the fourteenth century, they were scarcely yet adapted for this method of fighting, and in fact, from the results obtained, it was quite evident that such was the case. The German knights were shattered against these wagon fortifications of the Hussites, and found that their only chance of success was to make use of them themselves. The expression "wagon fortification" became then identical with "army." The garrison of these wagons, which at first had consisted exclusively of the commonest soldiers, was, after the Bohemian knights began to take part in the fighting, composed of foot-soldiers and horsemen. These wagon fortifications, however, were only suited for marching and defensive battles. As soon as the assailants were weakened or driven back by the fire delivered by them, the cavalry burst forth therefrom, in order to reap the fruits of the victory. The infantry also took part in these sallies, but it was not at all suited to withstand an attack of cavalry. When such an attack took

place, its method of fighting was similar in every respect to that of the English. The Bohemians used high shields, pointed stakes, iron-shod flails and pikes, with which they took up a position, and indulged in hurling missiles from it at their pleasure. By far the greater part of the infantry consisted of archers, cross-bowmen, and hand-guns, and who were formed up behind this screen of shields. The assailant might also avail himself of the wagon fortification, and was in fact obliged to do so if he wished to profit by the fire of his weapons; for up to the middle of the fifteenth century firearms were only carried on the wagons. But if the assailant wished to storm the hostile wagon fortification, then infantry was a *sine quâ non*, in order to effect an entrance into it, and pave the way for the cavalry. Infantry was just as necessary to the defender as to the assailant. Another circumstance arose, owing to which the introduction of infantry was facilitated to a greater extent than would have been the case had it been alone due to tactical exigency. The feudal system had shown itself both in the French and English wars, as also elsewhere, viz., in the Hussite war, as being totally incapable of providing for the defence of the country, still less was it suited for aggressive war. Mercenaries were everywhere employed. Moreover the growing sovereignty of the princes and the greater diffusion of money favoured this system.

In Italy, where the feudal system had never taken firm root, mercenaries had been for several centuries the only soldiers. France and Burgundy emancipated themselves by the introduction of the ordnance companies, in quite another manner from that of the feudal system. They also employed numerous mercenaries. In Germany, after the Hussite war, the country swarmed with numerous bands of mercenaries, both horse and foot, who turned the scale in all the affairs between the princes and the towns, and were of the greatest importance, especially under Mathias of Hungary, and in the Prussian civil wars.

The enlisted infantry soldier had become the prince's servant, and found therein a counterpoise against the arrogance of the

knights; the latter moreover, as we have shown, could no longer dispense with infantry.

The extraordinary progress which artillery made in the second half of the fifteenth century, both technically, as regards the construction of the barrels, as well as of the carriages, and, besides, by the introduction of iron shot, increased its effect upon the battlefield. The wagon fortifications could not withstand the effect of the *kartaunen* and *schlangen*—names which were then given to the ordnance of that day—and they were no longer tenable. The dismounted English and French knights had to take to their horses again.

On the other hand, the facility which had been obtained in moving and working the ordnance permitted it to accompany the main body of the infantry.

The independence which, by this means, the infantry was now able to assume against the cavalry rendered the wagon fortification no longer indispensable for taking up a position, although it had a provisional value on the march, and in camp, owing to the protection which it gave to the flanks.

It is a notable fact that the Swiss were the first to disencumber themselves of it during their wars with the Burgundians. The strict discipline which the laws of their country imposed upon the Swiss, and which was due to the necessity for this mountainous people being ever on the *qui vive* against the neighbouring knights and the house of Hapsburg, made the Swiss especially suited to constitute the model by which the newly-created infantry should fashion itself. But it was more especially their manner of fighting, which was nothing more nor less than that of the old Germans, and was totally different from that of the English and Hussites.

Their armament, which consisted of halberds and long spears, with fighting swords and morning stars, without shield—the front ranks in armour, and their formation in deep masses—had, together with the mountainous country in which they fought, already made them dreaded by the knights. The ordnance

now enabled them to take to the plains, and to assume the offensive.

The small-arms (fire) which during the whole of the fifteenth century were quite secondary to the bow and the crossbow, at least as regards the rapidity with which they could be discharged, were of much less importance with regard to the capability for defence which they conferred. The Swiss made very little use of firearms: steel was the weapon alone suited to their formation in deep masses, and to their method of fighting. Towards the end of the century the proportion was 1:5.

It cannot therefore be said that it was owing to hand firearms that modern infantry owes its existence.

Owing to the results obtained by the Swiss in their Burgundian wars, the German foot mercenaries, who up till now had adopted the armament and manner of fighting peculiar to the Bohemians, adopted that of the Swiss, and the name "Landsknecht" was, shortly after, that by which they were called.*

They also dispensed with the wagon fortification during the disturbances in the Netherlands. The youthful Maximilian, subsequently Emperor of Germany, was their instructor; the Swiss and Venetian wars their schools. In the early wars of Charles V. and Francis I. they already outbid the Swiss, and were more in request than the latter. All Europe soon learnt to know them by sight. The attempt to create an infantry thoroughly capable and full of vitality in France failed, because nowhere had the feudal system taken firmer root, and it had excluded the people from the use of weapons. Bowmen alone had arrived at any perfection. France, therefore, was obliged to have recourse to the Swiss and to the "Landsknecht," whom they took into their pay.

* It was nevertheless more of an adventitious circumstance that the name "Landsknecht" was introduced at the time when a change took place in the nature of the men's armament. The title "Lanzknecht," or spearman, cannot be justified, as the word "Lanz," spear, was never used in Germany, and cotemporaries like Oliver de la Marche and Pirkheimer refer the expression explicitly to "Landsmann" (*compagnon de pays*) and servants of the land (flat land in the vicinity of the Swiss).

On the other hand, a nationality appeared towards the end of the fifteenth century which produced an infantry remarkable for its excellence. This was the Spaniards. The wars which had been waged for centuries against the Moors, and which had been principally carried on by the towns, had had the effect of creating an active and excellent infantry, which, soon after its first appearance in Italy, towards the end of the fifteenth century, assumed the armament and method of fighting peculiar to the Swiss.

At first their method of fighting reminds one of that of the Hussites, as they used shields, and short swords for close combat, and surrounded themselves with wagons in the shape of a fortification. The Italians also, in the Venetian wars, adopted the Swiss method of fighting, and tried to outdo them in the length of their spears.

At the close of the fifteenth century, therefore, the three arms, infantry, cavalry, and artillery, with which we shall be concerned by-and-bye, had assumed a tangible form with regard to one another; and in the year 1528 a German author expresses this in the following striking words: "When a lord (*ein herr*) wishes to expend 300,000 florins on a war, he must give 100,000 for the mounted equipment, another 100,000 for the artillery (*artalerey*), and the last 100,000 for the infantry."

Before we come to examine more closely the union of the three arms for fighting, it is necessary that we should examine each one separately. The exclusive arm of the Middle Ages, the cavalry, had during the course of the fourteenth and fifteenth centuries undergone many phases in the course of their development, as they had to take into account the many alterations which we have partially touched upon above. At the close of the fifteenth century it was more heavily armed than it had ever been before, and each nationality had its own peculiar manner of fighting.

In Italy, during the second half of the fourteenth century, the national mercenaries had, under competent leaders (*Condottieri*), succeeded in clearing Italian ground from foreign hordes,

and had perfected a system of tactics, which, although its results had given rise to much ridicule, nevertheless contained the germ of the tactics of modern times.

Composed almost exclusively of bands of cavalry, caution formed the first consideration, both in their formations and in their fighting, consequently there were several divisions, each formed by a number of small bodies; these were successively employed, and the reserves were admirably brought into action at the proper moment. At the same time they had a superior armament.

Italy was the ground where the other nations studied and brought home progress in the armament of man and horse. The Condottieri had no need to fear contact with foreigners. The Armagnacs, as well as the German army of the Emperor Ruprecht, found them to be very superior as opponents, but in 1494 they went down before the combined arms of the modern army, consisting of cavalry, infantry, and artillery, like cards at the slightest touch.

In the fourteenth century the French cavalry found itself obliged to follow the English method of fighting, and to dismount in order to fight in conjunction with the bowmen. By the creation of the ordnance companies under Louis VII., they became a standing corps, and had a more fixed organisation. It appears that it was only after that time that they made use of the shallow formation which French authors declared to have been the case some time previously, although there was not the slightest foundation for such a statement. It was undoubtedly the ordnance which necessitated this formation, after it had made their method of fighting on foot quite impossible.

The formation consisted in this, that the head spearman (*chef der lanze*), the gensdarme, was put in the front rank, and behind him came the men-at-arms belonging to him, so long as they were not bowmen.

The mounted bowmen fought separately, generally in the advance. The number of ranks of men-at-arms would not therefore have been more than three or four.

The squadron consisted originally of 100 lances, which were later on subdivided into half and quarter squadrons of fifty and twenty-five lances. Companies of 100 lances were reserved for royal princes alone.

The French liked fighting with a very extended front, and had therefore seldom more than two lines of battle. Charles the Bold alone, had four lines behind one another.

In contradistinction to the shallow formation of the French, the German cavalry were formed up in deep masses having a point in front, and only after the time of the Emperor Maximilian were they formed into square bodies with the same number of ranks as files.

Charles V. was the first to assume a normal depth of twenty ranks, but it appears to have been only in the Spanish cavalry, for the Germans fought in deeper formation.

The heavily-armoured men constituted the point and surrounded the flanks, the ordinary horsemen were in between. The apex was blunted, so that the first rank consisted of three, five, or seven spearmen (heavily armoured), according to the size of the whole body, and the succeeding ranks increased successively by two files up to a certain limit, when the remaining ranks contained an equal number of files.

They were likewise reckoned according to the number of the *kyrissers*, as the spearmen were called before the time of Maximilian; before this, according to the number of helmets or spears. The size of these bodies varied, but 100 spearmen appears to have been the normal number. The *ordonnance* companies of Maximilian were of the same strength, consisting of four standards, each composed of twenty-five *kyrissers*. As there were seven mounted men to each *kyrisser*, the standard (*fahne*) had a strength of 200 horsemen. There were also an extra standard with a strength of 250 horses which constituted an advanced guard. The bodies of horse were consequently 800—1000 strong.

We know from Konspergen that many more than four stan-

dards were joined together in one body, as was likewise the case with the bodies of "Landsknechts." We know, as a guide to the proportion of these bodies, that a *rottmeister* or file leader was appointed to each fifty horses. Consequently each body would correspond to 2500 horses.

In the time of Maximilian every "kyrisser" had a mounted arquebusier assigned to him. In Germany the crossbowmen were quite abolished, whereas the archers remained for a long time as part of the French army, as was also the case with their infantry.

The German cavalry fought in three, sometimes in four, divisions during the whole course of the Middle Ages. Nothing certain is known as to the distance between these divisions. In every case it was very small. If the armies were small, as was usually the case, each division consisted of one of these bodies. With larger armies each division consisted of several of these bodies.

It was the rule for the advance to be made by divisions, and to allow the first one to fight until it was exhausted, and then to relieve it by the following one. The former then retired to the wagon fortification, which was in the rear, and there it reformed its ranks, and adjusted itself rapidly into its proper order. Good generals kept a reserve in hand which did not take a part in the above method of fighting. This custom had been introduced during the Crusades.

After the infantry of the Swiss and of the German "Landsknechten" had, towards the end of the fifteenth century, definitely adopted the plan of fighting in deep masses, and had become an integral part of the army, they also formed themselves into three divisions, each consisting of a separate body, to which a troop of cavalry was attached.

These divisions were formed up very close together, in such a manner, however, that the hind ones could pass the front ones; the cavalry were posted on the flanks.

The number of files and of ranks in these bodies of infantry

was equal, their depth therefore was greater than their breadth.

After the Spaniards and the Italians had assumed the Swiss formation, they made the bodies square, so far as the ground allowed, so that the relation between the number of the ranks and that of the files was as 3:7.

The number of musqueteers at the time of the Italian wars, on the commencement of the sixteenth century, was a very small one. The banneret of 400 "Landsknechts" had only fifty arquebusiers at the time of Maximilian, whilst with the Swiss their number was never more than a fifth of those who carried steel arms. The higher commands consisted of ten such bannerets, so that these may be looked upon as forming a tactical unit, and comprised a body of 4000 men, 500 of whom were musqueteers. This number of the latter was sufficient to enable the front and flanks to be covered with from three to four ranks; five was the maximum. When the cavalry attacked them, they were obliged to take refuge in the ranks of the pikemen. The barrel of the arquebuse was still very short, but it had a sort of matchlock provided with a simple touchhole. When taking aim the habit of laying the butt against the cheek had begun to come into practice. No attempt had as yet been made to organise either the infantry or the cavalry into regiments.

The bannerets were united together into bodies as circumstances required, and these consisted of 4000, 8000, and even more.

The artillery was posted close round the infantry, as their most essential support. In order that it might possess mobility, it could only consist of the lightest calibres (falconettes and large arquebuses mounted on wheels). We must consider it as quite exceptional when even guns of large calibre were employed in battle, and it was rarer still that the artillery, as at Ravenna, freed itself from its close connection with the infantry, and was used to take the enemy in flank. Although very slow

when firing, its effect upon the deep masses of the infantry and cavalry was fearful. The formation of three divisions in the small armies, which appear to have been the rule at the end of the fifteenth and commencement of the sixteenth centuries, caused the front to have too small an extension, so that these divisions often deployed when the cavalry filled up the intervals between them. The vanguard (*avantgarde*) then formed the right wing, the main body (*bataille*) the centre, the rear guard (*arrière-garde*) the left wing. In this fashion the modern army may be said to have come into existence, but it was in a very clumsy manner; nevertheless this was due in a great extent to the peculiar circumstances of the times. It was useless for the critic, by means of the old writers, to recommend anything better. The universal adoption of these systems showed that under the existing conditions they alone were the right ones, although the most incongruous elements were concealed in them. A heavily-armoured cavalry, an infantry having a bad deep formation, was opposed to artillery which was becoming every day more formidable. Nevertheless the cavalry could not dispense with its heavy armour, as it was necessary in order to cope successfully with the infantry; and the deep formation of the latter was necessary in order to withstand the cavalry. The next object of the attack was therefore to render the hostile artillery harmless, which was done by hurling a forlorn hope against it in order to capture it. The fight then became a severe struggle with the steel arm of one body against that of the other. The assailant had undoubtedly, since the improvement in firearms, great difficulties to overcome. He was compelled to develop his attack at greater distances from the enemy, and the heavily armoured men were obliged to traverse great distances, in order to reach the enemy, when they were generally fatigued by their exertions. Usually the defender did not wait for him, as the unruly mercenaries would not remain steady in the face of the hostile artillery fire, but rushed to the attack against the wishes of their commanding officers.

We shall now see that the improvement in the system of tactics hinges itself upon the improvement of small-arms, as the latter, at first still under the protection of the pikemen, became more and more formidable to the cavalry, later on no longer required the support of the pikes, and finally almost excluded cavalry from taking a part in tactics, whilst almost all the infantry systems were sufficient to keep off the cavalry.

Of just as great importance was the effect which the use of the small-arm exercised upon the cavalry itself, as during the course of the sixteenth century it appears to have almost usurped the place of the steel arm in that branch, and made their formation and tactical employment entirely dependent upon it. This lasted until the infantry, on its side, completely ignored the steel arm (line tactics).

The cavalry became, by this means, again for a time the predominently deciding arm, until the infantry had discovered new methods of formation which assigned the steel weapon to its true place.

Artillery, on the contrary, had exercised very little influence on the system of tactics; on the other hand, it had gained great influence on the conduct of the fight, as in the hand of the general it was the instrument which was the most to be depended upon.

Sixteenth and Seventeenth Centuries.

We have become acquainted with the important part which the infantry firearm played at the commencement of the sixteenth century. Progress in the manufacture of the powder, which was now corned for the musket; the introduction of a better kind of gun-lock, with a slow-match as the means of ignition; increased length of the bore, &c., caused the musket to become by degrees an efficient weapon of war; and in the Spaniards we find an infantry force who knew how to make the best use of it in battle.

These alterations appear for the first time when the wars between Charles V. and Francis I. broke out. Crossbow and longbow completely disappeared. Fighting in extended order

received a greater development, and enriched tactics with some essentially new expedients.

The importance of taking advantage of the ground was thoroughly realised, and increased the advantages of the defence to an extraordinary extent. Under otherwise similar circumstances, upon the "disposition" alone—*i.e.* the choice and judicious occupation of the position—depended the victory. What was meant by an unassailable position began to be understood.

The assailant found that neither in his still very clumsy artillery, nor in the extended order of fighting of his arquebusiers and musketeers, had he the means for succeeding in his attack, and was, owing to the heavy armament and deep formation, hampered in his movements to the greatest extent.

The artillery, owing to the great development of hand firearms, fell into the background, and was neglected. One gun at the most was considered sufficient for 1000 men, and the question was raised whether it would not be better to dispense with the guns entirely in the field. At all events, the deep formation of the pikemen continued in force in spite of them during the whole course of the sixteenth century.

The hand firearms increased with each decade, so that at the end of the sixteenth century they became as numerous as the pikes. The musketeers were partly distributed on the flanks of the bodies of pikemen, but the greater number constituted themselves as skirmishers in separate bodies at the four corners of the square of pikes, from whence they carried on a skirmishing fight.

The Romance nations evince in this latter respect a decided superiority over the German ones, but as the final result remained in a great measure dependent upon the pikes, and as the Germans moreover were unsurpassed in the close order of their mass-formation, the German mercenaries were in universal request. The German mercenary element was consequently developed to an extraordinary degree, all the European States availed themselves of it. This avowed fact, viz., that it is only when fire-fighting is immediately connected with the shock that

follows it that its true value appears, and which is as much in force to-day as then, may be stated as a further instance of it.

The great numerical increase of the musketeers, and their inability to defend themselves against cavalry, rendered it necessary that measures should be taken to give them adequate protection against the attacks of the latter. Consequently the wagon fortifications again played an important role at the close of the sixteenth and beginning of the seventeenth centuries, and other mechanical means were also tried. Real progress, however, lay in the alteration of the tactical methods of the infantry, which must be such as to enable the pikes and the musketeers, by mutually protecting one another, to withstand the cavalry.

The clumsy deep formation of the pikes was altered into a hollow one, and in order to make it more flexible, both for moving and handling, the parts which constituted the sides were formed into independent battalions. The space between these smaller bodies was intended to receive the musketeers when they fled before the cavalry. As the depth of these bodies was diminished, and as the flank battalions were allowed to close in upon one another, and were used as a second division, an extension of front was gained. The rear battalion of the hollow square then constituted the third line, or when several such squares were combined together it might be entirely dispensed with.

It was also now no longer considered necessary to adhere rigidly to these hollow squares. In general it was found quite sufficient to place the battalions *en echiquier*.

In the formations which Prince Maurice of Orange made use of these new methods appear to have become thoroughly developed. He formed advanced guard, main body, and rear guard, each of some four or five small battalions, in the above formation, which, while each division moved up by their left into battle, thus constituted a fighting formation of two to three lines.

In case the ground did not permit of this deployment, so to

speak, the three divisions stood one behind the other at division distance, so that the first line was formed by the advanced guard, the second by the main body or "bataille," the third by the rear guard. In each line the centre battalions, when there were four of them, were somewhat advanced; the rear ones, which would have completed the square formed by each division, dispensed with.

Gustavus Adolphus, likewise abandoning the system of having a hollow space surrounded with battalions, by connecting several such units together, next made use of the three lines system; and later he adopted a complete line formation, with cavalry on the wings. The centre battalion in each division (brigade) was somewhat advanced. There was no longer any talk of having a fighting disposition, consisting of advanced guard, main body, and rear guard, but of lines, with right and left wings.

The French adopted the Dutch forms without reserve, but soon took up the line formation. Since the time of Henry IV. there were some standing regiments, a feature common to France, Spain, and Turkey alone. The wars of the Huguenots had stirred up the warlike spirit of the French nation; and Louis XIII., owing to his partiality for infantry, understood how to improve this arm. "Puysegars octagon" was nothing else than a hollow space surrounded by battalions, and is an indication of the origin of the new alterations.

The Spaniards and Austrians still kept to their great masses of pikes of 3000 men in spite of this progress, but they also formed them into three divisions in echelon, until, during the course of the thirty years' war, they were obliged to adopt a more extended formation, and to have recourse to the two line system, and to smaller tactical bodies. The strength of the battalion was from 500—1000 men, and was now composed of pikemen in the centre and musqueteers on both flanks.

Owing to the mutual support which these bodies gave one another, the depth of the pikemen was no longer such that each one could withstand the attack of cavalry, but it was

made such that the hindermost rank could reach beyond the first rank with their pikes, and that the musqueteers could keep up an unbroken though slow fire, so that the first rank after having fired retreated to the tail end, and would be ready loaded when the last rank in its turn came to fire. The rapidity of loading had so far advanced in the thirty years' war that a depth of six ranks was sufficient for the above purpose. A similar depth was necessary for the pikemen, to enable all ranks to exercise a proper effect upon their immediate front.

It is to the further improvement in firearms that the principal share in these alterations in infantry tactics is due, but even these new plans would not have thrust themselves to the front, had not important alterations occurred in the cavalry, though to the certain disadvantage of that arm.

During the course of the sixteenth century, the deep formation of the German cavalry had been maintained against the shallow one of the French gendarmerie, and certainly advantageously so, on account of the firm consistency of these deep masses. All changes in the armament had the eventual effect of introducing shallower formations.

The cavalry still consisted of noble heavily-armoured horsemen with their men-at-arms. The archers and crossbowmen were eventually changed into small-arm men, armed with the "fire-striking weapon" (pistol with a wheel lock). We have already seen that this begun in Maximilian's time, when the pistols, however, had no lock. The causes which led to the gradual abandonment of the lance by the noble knights were as follows, viz., the preference for small-arms; the heavy weight of their armour—the thickness of which had to be continually increased; and the circumstance that by the crossing of the European race of horses, which happened after the commencement of the sixteenth century, a retrogression ensued as regards their powers of endurance. The "kyrisser," who had previously carried a lance, now became the "kürassier," armed with a long pistol; and the mounted crossbowmen became the mounted

"arquebusier," armed with a long firearm. In addition to the above, there was the mounted infantry soldier, the dragoon, upon a weaker horse.

This change was already completed towards the end of the sixteenth century, even after the French gensdarmes had adopted the pistol after the example of the Dutch cavalry. The Spaniards alone retained the lance for some little time. In the thirty years' war it had nevertheless completely disappeared.

The pistol had this advantage over the lance, viz., that when fired at a short distance it was certain to penetrate the cuirass; while the lance did not pierce the harness, the weight of which was always increasing during the course of the sixteenth century; and moreover a slighter horse was required for the pistol, as the cuirassiers only moved at a moderate pace. Consequently, when cavalry was engaged against cavalry, the firearm had a decided superiority over the lance, but when fighting against infantry it was useless unless disorder had broken the cohesion of their ranks.

The mobility of cavalry had so far diminished, that bodies of foot-musketeers accompanied it, placed between the squadrons, in order, by their co-operation, to produce confusion amongst the enemy's ranks. This was the predominant object of the mounted arquebusier, who was not intended to make an attack himself.

Even the much lauded improvement which Gustavus Adolphus introduced into his cavalry is overrated. He also employed foot-soldiers between his squadrons, and his cavalry did not make use of their swords until they had fired off their pistols.

Out of the deep masses of the cavalry of the fifteenth and sixteenth centuries, small bodies had arisen consisting of from sixty to eighty horses, which stood next to one another in regiments of five squadrons, the ranks of which were from three to five men deep, without having made any material advance in mobility.

If the value of cavalry, from what has been said, had materially deteriorated, and if the infantry were in consequence still

able to retain the clumsy formations of the sixteenth century, the relative worth of the former was not materially lessened thereby, as it represented predominantly that offensive element, which the infantry lacked in so great a degree.

The artillery made remarkable progress in the course of the sixteenth century, both as regards its *personnel* and *matériel*. For instance, the *matériel* was much simpler, and was limited to a few calibres. To be sure, these calibres were common both to the long and short guns (schlangen and kartaunen) as well as to those guns which formed a mean between the above, and the thickness of their metal also varied considerably. In reality this may not have been quite so bad as the artillery literature of that time represents it to have been.

With regard to the *personnel* it ought to be mentioned that Charles V. assigned a nobleman to every two-horsed gun, and this plan was universally followed. The further progress of artillery may be expressed principally by the reforms made by Prince Maurice of Orange. He not only reduced the calibres to the twenty-four, twelve, and six pounders, he gave greater solidity to the carriages by introducing much stronger iron work and regulated the relations between their weight and that of the gun. But there is this especial feature to be remarked with regard the use of field artillery; he substituted gun cartridges with iron balls for the hail-shot which had been hitherto in use. It is an extraordinary circumstance that he turned no attention to the howitzer (*haufnitzen*), which had continued in use in Germany, although during his time successful results first attended the throwing of mortar-shells, and many attempts were made to fire hollow shot from the "kartaunen."

Gustavus Adolphus, also, who paid great attention to artillery, and adopted the Dutch methods in all essentials, did not hit upon the idea of using howitzers for throwing shells.

The relations of the *personnel* of the artillery were materially improved by the creation of artillery regiments under Louis XIV.

After this glance at the progress of the individual arms, it is necessary to go more thoroughly into their connection and method of fighting, and in this respect also to include the forms of the Dutch and Swedes in the general course of tactical development.

The formation of one single line of battle had, as we have seen, been adopted at the commencement of the sixteenth century, without, however, considering this as applicable to all occasions, as the terrain would under certain conditions make the formation in three lines necessary.

This latter plan corresponded to the old custom, and the constant endeavour to return to it shows itself during the whole course of the sixteenth century. But the small armies with which operations were carried on, and the circumstance that the bodies of infantry were so very large that it was seldom that more than three of them could be formed, constituted an obstacle thereto.

An endeavour was now at least made to obtain a gradual development of the fight, and to keep a reserve in hand.

The musketeer combat presented the means for attaining this, as it was allowed to predominate, whilst the masses of pikes were kept back.

A step in advance on this was made, and recourse was had to the attack in echelon by the pike masses themselves, though, owing to the clumsy manner in which it was done, and to the undisciplined bodies, seldom with success. "The one body must advance immediately in succession to the other." So we find it laid down from a manuscript source of that time, "one attack must follow the other immediately, ... one body, however, must not stand still and look on, as I have seen and experienced, until one after the other either wins or loses." Unquestionably the author had here the battle of Cerisola in view, as it occurred in his time.

Infantry was little suited for the actual reserve, as it was too slow in its movements. A considerable body of cavalry

selected for this purpose, was led by the lieutenant-colonel himself, who "must attack with his force at the very last moment, and exactly at that place where he sees there is greatest need of him, and as being most favourable for winning the battle."

Charles V., with his large armies, was enabled to fall back upon the three line system, each of which was composed of several bodies of infantry. The distance between these lines was a very small one, and no account of the effect of firearms was taken into consideration in estimating it.

The cavalry was posted between the infantry masses, and only a very small part was placed on the wings. In this latter respect, however, a considerable advance took place during the struggle of the Netherlands for independence, as the Spaniards placed their cavalry entirely on the flanks, and Prince Maurice of Orange followed their example. The importance of reserves in a cavalry combat was universally acknowledged, consequently, they were given a deep formation in three lines.

Falconets (five and six pounders) were placed in front of the bodies of pikes, and also on their flanks. Advantageous points of the ground were also used to unite the guns which were at disposal. Henry IV. made this an especial maxim. Prince Maurice divided the two purposes for which artillery was now used, by adding particular guns of small calibre to his battalions, and retaining some heavy guns at his disposal for placing on favourable points of ground, which were to introduce the battle. One gun per 1000 men was still the proportion.

The endeavours which were made in the sixteenth century to render the successive employment of troops feasible, could only be attended with success by reducing the size of the bodies of troops, and Prince Maurice was the first to carry this out. We have already become acquainted with the peculiar conditions which led to the alterations in the formation of infantry.

If we now proceed to examine the battle array and manner of fighting of Prince Maurice in accordance with the above points of view, the result is as follows. He reduced his regiments of

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infantry to 1000 men, which he formed into two battalions, in each of which the pikes were in the centre, and the musketeers on the flanks. He gave them a normal depth of ten ranks, and adopted the means which the legion had employed against the phalanx, as he made use of the mobility and handiness of these small bodies, so that, by employing their powers successively, he was enabled to bring about a decisive result. By this method he caused his opponent to expend his forces at an early period, whilst he himself retained fresh forces with which to deliver the decisive blow. For this purpose he disposed his forces in three lines, each of which consisted of several of these bodies. Fire-arms were not the sole means of influencing the ideas which led him to adopt this plan, but made the formation of these small battalions particularly feasible, and modified the shape of his legion so materially, that the distance between his lines was increased by from 200 to 300 paces; and by combining the artillery and infantry combat, he was enabled to introduce a much greater diversity into their fighting relations. Fire-fighting, and the shock of the small movable bodies of pikes, were now brought into closer relation.

The cavalry was formed into squadrons of 100 men each, and had a depth of five ranks in accordance with the same principles. Its chief weapon was the firearm.

Prince Maurice designed a system of drill for both arms, and exercised them in it. The accented word of command replaced for the future the unmilitary call. Discipline came into play, acting as a powerful lever upon tactics.

Gustavus Adolphus went farther on the same basis, diminished the depth of the infantry to six ranks, that of the cavalry to three ranks; lightened the weight of the hand firearm, which now consisted solely of muskets; increased the rapidity of the firing, by introducing the cartridge and the cartridge-box; increased the number of the musketeers to two-thirds that of the pikes; but, above all, he made use of the artillery (regimental pieces) in order to give his tactical bodies a greater independence, and to

break the phalanx of his opponent by an overwhelming artillery fire from a distance (heavy artillery).

Consequently he took a numerous artillery with him (three per 1000), part of which fired case-shot only.

Gustavus Adolphus had recourse to a more simultaneous employment of his forces—his system being somewhat opposed to that of the Prince Maurice of Orange—being based on a numerous artillery.

For when he also, in order to secure himself against reverses, formed two to three lines, it was to the first line that he looked to effect the decisive blow. Consequently, he placed his battalions of the first line close together, and gave up the echelon formation. The great development of the front of his line formation, and his overwhelming artillery, gave him an immense advantage over the deep masses of his opponent, and which he knew how to profit by, as he at once made a most determined advance upon him.

This was, however, only sufficient so long as the battles took place in the plain. As the powers of the artillery of that period were somewhat circumscribed (shells were not made use of in the field during the thirty years' war), it lost its power as soon as the opponent secured himself behind ground strengthened by art. As Charles V. had once, at Ingolstadt, remained perfectly quiet under the fire of the Protestant Princes, so did Wallenstein in his camp at Nuremberg. After the artillery had proved useless, Gustavus Adolphus exhausted in vain his musketeers in successive and badly-organised efforts against the flank of the hostile camp which was in the old stronghold at Zirndorf. Limits were now placed to the means which he had hitherto had at his disposal.

It was necessary that a new element should be brought into play in order to strengthen the attack. By diminishing the depth of the infantry and cavalry, the extension of their front, and consequent development of their fire, was increased, their mobility was augmented, and was, moreover, improved, owing to

the fact, that the preparatory fire-fighting of a numerous artillery, gave more freedom of movement to the other arms.

The advantages arising therefrom, allowed of other means being thought of for increasing the mobility of armies. The heavy defensive armour by degrees disappeared, and the cavalry was increased to almost the same number as the infantry. The power of the attack was greatly increased thereby.

The increased development of front allowed of the opponents being outflanked, and the mobility which had been attained enabled this outflanking to be carried out.

Manœuvring, *i.e.*, the art of falling with a superior force upon one of the adversary's weak points, then upon one of his flanks, was now introduced as a feature in the manner of carrying on fighting.

Turenne was a master in this, as, however, was the case in every successive method of fighting which he undertook.

We now for the first time find the attack equipoising the defence, and this reflection vindicates itself as containing the deciding element, viz., a keen estimation of the whole situation of the opponent, as well as of the effects which the means at the assailant's disposal will have upon him. The "disposition" which is obliged to take all these circumstances into consideration, and indicates the direction in which one's own powers are to be exerted, now appears with the middle of the seventeenth century as having as decisive an influence on the attack as it had during the course of the sixteenth century on the defence.

It would appear as if firearms were now to become of secondary importance, as it was mobility which exercised the greatest influence on the decision. They (firearms), however, have to cover the movements, and when the opponent has to be outflanked, they turn the scale. Mass fire, both of infantry, and artillery, is necessary for this purpose. Skirmish fighting disappears entirely for a century and a half.

Marshal Luxemburg was a worthy disciple of Turenne. The battle of Fleurus was a masterpiecc of the art of manœuvring,

that of Neerwinden quite possesses the character of some of Napoleon's battles.

It should not be overlooked that the increase which to a great extent had taken place in the standing armies had a material influence in effecting all this progress which had been made since the thirty years' war, a war which had brought out the most atrocious features of the mercenary element.

Eighteenth Century.

In consequence of further perfections in firearms, circumstances again raised a question as to all the progress which had been hitherto made in the higher tactics. The total suppression of the pike by the introduction of the bayonet-arm—which had been made practicable owing to the fact, that after the introduction of the flint lock, musquetry fire sufficed by itself to repel cavalry—was the next cause of this.

It was difficult to arrive at a correct comprehension of the consequences to tactical forms that must ensue from the total suppression of the pike, which took place about the end of the seventeenth and commencement of the eighteenth centuries. The shock-power (*stosskraft*) which infantry possesses in addition to the effect of its fire, and which was a feature peculiar to the pike masses, now disappears with them, as the shallow line formation of the infantry has no feature in common with it, which would be likely to bring the idea of the bayonet into reality. Custom follows its previous direction in favour of the shallow formation, in order that all ranks may be enabled to participate in the fire-fighting, and leads to the formation of tactical bodies, which are exclusively intended for firing. As these bodies were incapable of independent action, it was necessary that flank should rest upon flank, consequently, long lines were formed incapable of any movement. The tactics which made use of these lines were especially called line tactics *(linear taktik)*. Elementary tactics, however, still persisted in retaining their old-fashioned ideas.

So long as a portion of the infantry was armed with the pike, the battalion consisted of three distinctive bodies, the centre composed of pikes, and the two wings of musketeers, each of which moved independently of the other; whilst the battalion now adopted an homogeneous line formation, which, consisting of an unwieldy whole, permitted no suitable disintegration. The battalion was, for instance, when any particular object arose, optionally divided into a number of subdivisions beginning from the right wing, totally independent from any company connection, so that the men of these single divisions were without their officers. This continued during the whole course of the eighteenth century.

In consequence of all these circumstances, and the increase of armies which took place at the same time, by which the front was extended almost without limit, and the cavalry was reduced to a proper proportion to the infantry, *mobility* was reduced to a minimum; manœuvring appears to have become impossible Artillery sank to a mere auxiliary arm, and only a small force of it accompanied the armies. The guns were heavier than had been previously the case.

The battles of this time (war of the Spanish Succession) were decided by nothing more than what the Swiss, the *Lands Knechte*, and the German cavalry had been celebrated for in the sixteenth century, viz. order and cohesion *(geschlossenheit)*, which were now exemplified by the regular and intensive fire of a battalion. As the Germans and English excel all other nations in this peculiarity, these, and especially the French, suffered reverse after reverse.

A German commander now appears at the head of the French armies, who made himself completely master of the situation, and while developing the ideas of Folard, devised a new system of tactics by instituting a connection between the fighting in line, in column, and in skirmishing order—I mean the Maréchal de Saxe. Time and preparation, nevertheless, were wanting to enable his tactical principles to be brought into actual use.

He endeavoured therefore to introduce order amongst the French. But he did not succeed to such an extent as to prevail against the Germans therewith. He therefore adopted a third plan, viz. the successive employment of his forces, but in another manner than that of Prince Maurice of Orange, for he re-introduced fighting behind defensive posts as his method of giving battle—as it was more suited to the French disposition—and, moreover, he employed artillery, the *personnel* of which had meanwhile made immense strides in improvement, to an extent which had had no equal since the time of Gustavus Adolphus. The Germans, Dutch, and English sustained one defeat after another. A war between two German powers took place simultaneously with the above, and here we find that superiority in discipline, and the iron ramrod (Mollwitz), which enabled the men to load quicker and with more certainty, decided the day. Frederick the Great, however, came to the conclusion, that that was not alone sufficient. He therefore again turned his attention to manœuvring, which the defenceless flanks of the line formation rendered more necessary than ever, and for this purpose he introduced suitable elementary tactics, so far as they were still required in the Prussian army; for Leopold of Dessau had already laid the foundation in this respect.

This was first of all necessary in order to be able to manœuvre at all. The infantry were formed in three ranks, the tactical division of companies and subdivisions was introduced, the clumsy evolutions which had their origin in Prince Maurice's regulations were done away with. Doubling the ranks and files, the wide intervals between the ranks disappear. The elementary tactics of infantry were moreover completely revolutionised, for Frederick introduced the formation of columns in close order, and deployment from them (Potsdam manœuvres).

Of the cavalry he made for himself an arm answering all his purposes, and such a one as the world had never yet known. It completely dispensed with firearms. With these means and Prussian discipline, a power the extent of which no one had as

yet conceived any idea, he was completely successful in the two first Silesian wars. At the commencement of the seven years' war, the Austrians opposed him with a new arm for which he was not prepared. They covered themselves with a numerous artillery, which placed a limit on his manœuvering powers (Losowitz, Prague, Colin), so long as he himself did not make use of the same arm to a greater extent. The "grumblers" of Leuthen showed him the manner in which to cut his way through the enemy. The artillery mass was in future a decisive instrument with which he could cover his manœuvres, and prepare his attack. The Prussian artillery had at that time great advantages all over others (tubes for ignition, cartridges, limber, and axletree boxes), though perhaps they were somewhat inferior to the Austrians in some other respects, viz., in mobility.

The Austrians had now recourse to a new method, for they armed themselves with the *terrain*. This was the very thing which ruined Gustavus Adolphus with his predominant use of artillery. Two methods now offered themselves to Frederick the Great: either successive fighting, or else overpowering the opponent in detail, also in difficult ground, which in a further sense of view, is really the base of all manœuvring.

He was consistent and chose the latter, while he made use of artillery as the means by which he was enabled to command the most different natures of ground; and also in broken ground to rapidly overwhelm the enemy, at that point which had been chosen for the attack. By this plan he avoided the fighting for the acquisition of certain positions ("Postengefechte") which necessitates much valuable time being lost. Not only had each battalion a howitzer attached to it in addition to the two guns which it already had, but a reserve of forty heavy howitzers was formed, which Frederick always took with him in his later campaigns. He only once found an opportunity for making use of them, as in his later campaigns he invariably avoided battles. It was at Burkersdorf in 1762, and the result was excellent. His ideas on the subject are, however, laid down in the instruc-

tions for the year 1768. Besides this, by continually making technical improvements in their weapon, he made rapid firing on the part of the infantry much easier; and by the adoption of the light Austrian twelve-pounder, and the introduction of horse artillery, he materially improved the mobility of this arm.

Nineteenth Century.

We now come to the French Revolution, and from it, skirmishing and the column, those methods of fighting peculiar to the nineteenth century, took their origin. Fighting in scattered order, otherwise skirmishing, is the natural way of fighting of the infantry soldier provided with a firearm. This is the way in which the individual soldier will make the most use of his own powers. The column, whence issues the stream of skirmishers, and which receives them when they are threatened by hostile cavalry, is further, owing to the shock-power of its service ranks, peculiarly suited to reap the results of the previous fire-fighting of the skirmishers. The independence which arises from these attributes, and the facility with which the single mass could move in every direction, increases also the mobility when connected in larger bodies. Flank could no longer be lapped on to flank, and broken ground, which debarred movements in line, no longer placed any difficulties in the way of movements in column. The power of fire, and mobility, these two leading forces which govern fighting, were therefore both gainers by the adoption of these new methods of fighting, and the shock-power, which had been lost from the time the infantry ceased to use the pike, was now resuscitated by means of the column. The line formation was in no way supplanted by skirmish fighting and the column, but constitutes rather the third method of infantry fighting, in which the skirmishers are concentrated to deliver their fire *en masse*. Moreover, it is the fundamental formation. The advantages of these different methods of fighting had, since the time of the Maréchal de Saxe, been prominently set forth in the writings on the subject, and a numerous

party had been formed in France since the seven years' war which pressed for their introduction. The Maréchal de Broglie, the victor of Sandershausen and Bergen, was their most declared partisan; and had shown their applicability in the camps of Vaussieux and Metz. Nevertheless, the brilliant results obtained by Frederick the Great with the old line formations, pulled down the scale in favour of the opinions of the opposite party. A revolution was just the thing to thoroughly transform tactics so that they should become really practical.

Skirmish fighting owes its origin to the American war for independence. That it had existed in an extended form some centuries ago, was all that was known about it. The experiences which had limited its use, and had finally suppressed it, were likewise lost. Consequently, in the first campaigns of the Revolution, it was carried out to such an extent that almost all cohesion disappeared. The column was considered sŏlely as the reservŏir for the skirmishers, and not as that powerful regulator of the fight which gives the decision. Every one pushed forward so as to be in the foremost ranks, and it was only when some greater effort had to be made that the skirmishers packed themselves together in a mass for attack. Skirmish fighting in this manner attained its object only owing to the fact that the conditions were mostly in its favour; for the line formation which was opposed to it is, owing to its limited capabilities, a most unnatural one, besides which, owing to the *Cordon* system which the Allies had adopted, it was exposed in all its weak points. In spite of this, all its disadvantages—viz., disorganisation, which it causes; the impossibility of proper supervision; and the time which it demands to obtain any effect—the battles often lasted for days—became most conspicuous.

Consequently, after clear-sighted commanders had become trained, fighting was organised on more rational principles. Skirmish fighting was used only to weaken and exhaust the enemy. At the same time it was supported by a movable artillery. Adequate forces kept in reserve out of the fire-zone,

were intended, when the decisive moment had arrived, to exert a powerful influence on the fight by the shock-power of their serried mass. The successive employment of forces now appears in a new form, and the legion, which now takes the form of the the modern *division*, composed of all arms, again constitutes the base of this. The direction of the fighting itself, carried out in the above manner, has a pre-eminent claim to be entitled "the methodical battle."

The addition of cavalry and artillery as auxiliary arms increased the independence of the infantry divisions, and rendered them fit to accomplish independent fighting. The care which had been paid to the development of artillery since the seven years' war—its organic formation into batteries, the great mobility which it attained; but, above all, the horse artillery, which, since the commencement of the wars of the Revolution, had been introduced in masses into the French armies and had been attached to the infantry divisions, had an essential influence in giving them the boldness to act independently. The wars of the Revolution did not give rise to those tactical potentates—"cavalry and artillery *en masse*"— neither did they give methodical fighting that maturity which it attained later on, as it did not extend to the entire direction of the fight. The French armies of this period moved with very extended fronts, over a large extent of ground, each division was entirely independent of the other, as the corps connection was still wanting. The methodical fighting, necessary for the proper direction of battles in which large armies were engaged, only developed itself for the first time in the wars of the Liberation, under totally different premises, and from quite a different source. Between the wars of the Revolution and those of the Liberation lies the period of the Napoleonic plan of carrying on war, the richest that has ever existed for the development of the art of war, and furnishing an inexhaustible mine from whence to study that art.

Napoleon restricted skirmish fighting within closer bounds. He surprised the enemy with masses, whether it was against the

centre or the flanks. The boldness of his strategetical plans facilitated those tactical combinations which confused the enemy. Manœuvring, which had lain dormant since Frederick the Great, now modified in accordance with the new tactical forms, again stepped into the full enjoyment of all its advantages. But circumstances obliged him, just as much as they had Frederick the Great, to prepare the shocks of his masses with a numerous artillery.

At Eylau, at Friedland, and at Aspern, his infantry masses dashed themselves to pieces against the hostile artillery. After this, and especially at Wagram and subsequently, he concentrated masses of artillery numbering from sixty to 100 guns upon the point of attack, in order to prepare the way for the shock of his infantry and cavalry masses. But he did not provide himself with those means which Frederick the Great had done with his howitzer batteries, so that the artillery mass could be made use of in the event of the terrain sheltering the enemy from direct fire. Owing to this, Napoleon got into great difficulties in two of his principal battles—at Borodino, and at Waterloo.

The French appear to have never understood the nature of the howitzer.

In every case where the services of the artillery, owing to the want of this weapon, failed, Napoleon was obliged to have recourse to a series of successive efforts, which cost him infinite forces and time, on every occasion where an immediate result was the first condition necessary to ensure the success of his designs.

Meanwhile, a great revolution in tactics had been brought about, which stood out most prominently at the battles of Borodino and Waterloo, the consequences of which were never even thoroughly mastered by Napoleon himself. I mean that deep formation of armies which, owing to the results of active defence, had also become necessary for the attack.

The extraordinary increase of armies occurred simultaneously with it. It will be advantageous to dedicate an especial section to the alteration of tactics from these points of view as

the military literature of the long periods of peace, beginning from the wars of Liberation up to the general introduction of rifled weapons, has exercised a predominant influence upon tactics.

(*b.*) FROM THE WARS OF LIBERATION TO THE GENERAL INTRODUCTION OF RIFLED FIREARMS. PEACE THEORIES AND THEIR REFUTATION.

WE will now examine the causes for the deep formation which the European armies adopted during the course of the wars of Napoleon I.

During the wars of the Revolution a very extended formation generally prevailed. Napoleon was indebted to it for the great results of his first Italian campaigns. But in the other French armies not the slightest attempt was made to imitate his shock tactics with columns. The French divisions, not yet united into *corps d'armée*, fought now as formerly in very loose coherence. Even the results of Suwarow's bayonet attacks had not the effect of making them abandon this formation. The formation of *corps d'armée* in the year 1805 put a limit to this, and necessitated a change in the tactics of their opponents. The great increase of armies which then ensued had the effect itself of deepening the battle formation, so that the troops might be more in hand. This was especially conspicuous at Wagram. Napoleon was indebted to the depth of his formation for being able to repel the attack of the Austrian right wing, and the Austrians again paid for the want of depth of this wing with the loss of the battle.

At Borodino, favourable circumstances gave the Russians the opportunity to make an active defence, which resulted in their making an obstinate resistance. Their right wing, which was considerably extended, was perfectly unoccupied, and was consequently enabled to be disposed of as the emergency required.

The "active defence" had already previously exercised the most important influence upon the formation and first disposition of armies. Napoleon had already made the way for it in his Italian

campaigns—those of Rivoli and Arcole—and by the blow which he struck against the centre of the extended movements of attack which the allies were making, produced an overwhelming effect upon the whole military world. In Spain the English were indebted to the "active defence" for their glorious results.

Talavera gave the French the first foretaste of it. Albuera and Salamanca became glorious victories.

Theory became at this period master of the matter.

We possess a memoir of a Prussian officer from this period (1811)—later on, General von Clausewitz—comprising the most important elements of the art of waging war, as a supplement to the instruction which was imparted to the late King—at that time Crown Prince—and which is added to the third volume of the writings which that general has left behind him. He expresses himself as follows with regard to the "active defence." "The main principle is, never to remain passive; but to attack the enemy in front and on the flanks, even when he attacks us himself. Consequently we should defend ourselves only upon a certain line, in order to cause the enemy to develop all his powers in order to attack the same; and then we should assume the offensive with other troops which have been kept in reserve. As his Royal Highness once very admirably remarked: 'The art of intrenching should not serve the defender in such a way that he is to keep himself in greater safety, as if he were behind a wall, but in order that he may attack the enemy with greater result.' This is what should be said of all passive defences: viz., that it is always only a means for attacking the enemy with advantage in that particular part which I had foreseen, in which I have disposed my troops, and which I had arranged for myself. This attack on the part of the defence can take place at that moment when the enemy actually attacks me, or whilst he is actually marching against me. It can take place in such a manner that I can withdraw my troops when the enemy is actually preparing for the attack, and by this means draw him into a terrain which is quite strange to him, and then attack him from all sides. The deep

formation, viz., where two-thirds or half the army, or even still less, is in front, and the remainder directly or obliquely in rear, and if possible concealed, is admirably adapted for all these dispositions."

Tiedemann expresses himself precisely in the same manner. These principles with which suitable minds were imbued, received their full value in the campaign of 1813, from the Prussian side. The design of the battle of Gross Görschen; the sally made by York and Barclay from the position of Bautzen upon Königswartha against the French army, which was actually marching upon it; the surprise at Hainau; the battles on the Katzbach, at Gross Beeren, and at Jüterbock, ensued therefrom. The last three were blows which, arising from defensive circumstances, snatched the initiative from the enemy, and made the word "Forward" the motto for the Prussian colours. This "Forward" was incarnate in Marshal Blucher. "To attack," regardless of everything, was now the only law for the Prussians. This, however, requires a deep formation to prevent its coming to a standstill.

We must not overlook the fact, that in this universal adoption of a deep formation, lies one of the greatest revolutions in modern tactics. There was, as it were, a return to the time of Gustavus Adolphus; for, since then, a sensible pushing on one side had taken place with regard to those conditions which were based essentially upon firearms, or, rather, on the defective tactical methods which, owing to the imperfection of the firearms of that time, rendered the connection between the fire-fighting and the shock extremely difficult. It is exactly here that the art of generalship may be said to take its root.

Though, at the time of the Napoleonic wars, hand firearms had not attained such perfection that skirmishing had become the actual manner of infantry fighting, the easy transition from scattered to close order, and *vice versa*, enabled the closest relation to be maintained between fire and shock. It was no longer necessary, in considering the construction of the battle formation, to take the fire-fighting as the only consideration, which was the

case when the linear tactics were in vogue; other tactical requirements could also be taken into account.

While we are considering this matter, there is an essential factor to be considered, viz., the manner of conducting the battle, and its most important implement—the reserves. In the first instance, the reserve is necessary in order to meet any unforeseen eventuality; in the second instance, however, for the decision; so that the positive end had in view may be followed up, and a thorough result obtained. It is the connecting link between the disposition and the guidance of the battle.

The wars of Liberation occur at a time when the necessity for a deep formation, one which so completely corresponded with the reserve system, was universally acknowledged. The consequences which arose therefrom as regards the attack were, however, much less considered. At the beginning of this war, no other method of fighting, as regards the attack, was known than the "manœuvre," simply borrowed from Napoleon's plan of fighting. This is most emphatically expressed in General Clausewitz's teaching before the war, which we have previously alluded to, by Tiedemann, and in the instructions of Frederick William III., during the armistice of 1813, Nevertheless, in reality, advantage was taken of this deep formation, as the most natural method of the methodical fight. The reason was, because, under the leadership of Prince Schwarzenberg, the small stake at issue which favoured it, and characterised it, appeared more convenient and less dangerous, when the moral impression which an antagonist like Napoleon created was taken into consideration. In the years of peace which ensued, something even sublime was discovered in this circumspect proceeding, which was so directly opposed to the nature of the attack, since individual battles of Napoleon could be recalled in which he was said to have made use of methodical fighting.

But the conviction was much less general, that in his later campaigns he had been unfortunate in the application of his manœuvres, or else that he had used them unskilfully. In fact,

the application of the manœuvres had, owing to the deep formation of the antagonist, become much more difficult.

The plan of drawing the adversary's reserves in another direction by false attacks, and taking care by false movements that the real place where the attack was to be made should not be discovered too soon, was now employed more than ever. But we see nothing of all this in Napoleon's last battles. He was unable to make use of artillery masses in difficult ground, as he had not the nature of artillery necessary for this purpose at his command. We miss, also, a sufficient combination, and a continuous support of his blows, as well as a suitable formation of the troops which he employed for this purpose. He had already at the time of the first Italian campaigns, hurled his battalions against the hostile front like a "battering ram," according to Duhesme's expression, and it was the same at *la Belle Alliance.*

The ten battalions of a division were generally formed up one behind another for an attack at subdivision (*zug*) distance apart, each single one in a deployed line. When there were twelve battalions to a division, two battalions formed the front line, and the others were behind them. The English, however, were not deceived thereby, delivered their fire when they came in close proximity to the enemy, and then threw themselves upon the front and flanks of the unwieldy column.

The attack which is pushed with the view of obtaining a decisive result, requires something more than that the reserves should fight methodically. The superiority in fire-power in front must correspond with the superiority of the reserves in depth. Frederick the Great placed in addition to that wing which was to make the assault, an advanced guard before it, so that he had three lines of infantry. He also gave the greater part of his cavalry to this wing. To the advanced guard was assigned the artillery mass. The refused wing was kept as a reserve for that part of the line of battle which was not employed for the shock. In the fighting of the present day, an especial reserve is necessary to support that portion of the front which is not intended to attack

in order that any offensive movement on the part of the enemy directed against it may be met. Moreover, in the methodical fight which they make use of, the means for forming their own reserves will be found.

In manœuvring, a totally different signification from that of their employment in the methodical fight, is given to the reserves. Whilst, in the latter case, they have this double purpose to serve—firstly, to guard against eventualities, as for instance to hold themselves in readiness to meet any counterstrokes on the part of the enemy; secondly, to bring about a decision by attacks *en masse*—the use to which the reserves for manœuvres would be put is quite different; where the one has one predominant object, the other has another predominant object.

In the methodical fight and when on the defence, should the force at the disposal of the general commanding be at all weak, the reserves would be only too easily exposed to the danger of being wrongly employed, as they would be thrown by brigades into the battle for the purpose of reinforcing those already engaged, or else when the fight is assuming a doubtful aspect, they would be used for taking up a position, consequently to the detriment of the fight. In manœuvring, on the other hand, only those reserves which are intended to support a feigned attack, and to guard against any hostile blow upon these points, are liable to be wrongly employed. The reserves which are intended to support the attack of the main body upon that point against which this attack is to be directed, have, when following this attack, such an unmistakable object that their employment cannot lightly undergo any alteration.

Moreover, the confidence which the disposition—owing to the actual task which it gives these forces to perform—imparts so thoroughly down to the common soldier, is so great, that it leaves quite another impression upon the fight, and strengthens the *morale* of the front lines to such an extent that they seldom require the actual co-operation of the main body of the reserves which are following them. The simple knowledge that this

reserve is actually following, adds greatly to the moral power; whereas in the methodical fight, where the front lines have only general objects in view, which have to be attained, and all that is known is, that in case of success there is a reserve ready to co-operate in the final decision, the moral feeling is not likely to receive so powerful an impetus. We shall approach this subject nearer, when we go more thoroughly into those two principal forms of tactics, the attack and the defence.

There is no doubt that it is when on the defensive that the employment of forces in succession has its greatest value. It enables us to arrange our forces in a concentrated manner in considerable depth, ready for any purpose for which they may be required, at the same time under cover; from it, this great advantage can be drawn, viz., that after the hostile disposition has been examined it may be broken through; should, however, this not be decided upon, then it permits of the enemy being driven out of our own position should he have penetrated it; or, should he have turned it, to turn him again; should any weakness have occurred in making the original disposition, it can be easily strengthened.

At the same time nothing is lost as regards the advantageous occupation of the ground, for a deep formation is necessary in order that the full results of the fire-fighting may be reaped by the subsequent attack to the front. These advantages are so striking, that at the first glance it would appear as if the assailant could now do nothing further beyond advancing against the defendant's position in deep formation, secured on all sides against any attacks on the part of the latter, and leave the decision chiefly to number, *i.e.*, to the superiority of fresh forces—which superiority must either have previously existed and been kept in reserve, or else ensued from the great economy with which his forces have been used during the course of the fight.

This then was the system which may be said to have been the prevailing one at the time of the universal introduction of rifled small-arms; and which was alone found suited to the progress which intelligence had made up to this time, because

in the numerous fights where individuals had to rely on their own resources — resulting from this system, the lower ranks were called upon to exercise their own intelligence to the utmost, and by estimating the strength which remained available after each side had become weakened, it would appear that an estimation could be arrived at as to the result.

This does not, however, always follow. First of all the advantages on both sides are not equal, since the defender has the advantage of knowing his ground, of having prepared it beforehand, and has his dispositions all ready to take advantage of it, while the assailant is deprived of all these advantages. Under circumstances which are otherwise similar, it is exactly the ground which favours the economy of forces.

Should the assailant endeavour by gradually weakening the defender to gain a superiority of numbers, it would be greatly to his disadvantage to do so; and the more so, as the defender in this manner of fighting, would be able to add to the advantages of the *terrain* for the fire-fighting, those of being able to surprise and surround his enemy. The gradual employment of forces is moreover only advantageous in the case of infantry fire-fighting; for the two other arms demand categorically the employment of their whole strength at one and the same time, *i.e.*, a superiority of their front line, the only limit to which is the retention of the necessary reserves, in order that they may be ready to strengthen this line when required, or for any unforeseen eventualities. The assailant, when he chooses this nature of fighting, is therefore compelled to impose upon his infantry the principal task—the fire-fighting. Consequently that arm has much greater difficulty in overcoming the advantages of cover which the ground confers on the defender, than the artillery has, and in fact can only do so by incurring losses which are out of all proportion, and which cannot be foreseen; moreover, it has to deliver its assault *en masse*, and has therefore every inducement to spare itself until the moment for doing so arrives. Any calculation as to the result—for it is

only now that that stage of the fight is reached when it would be too late to form an estimation as to it—is of little value; the intelligence of the lower ranks is a very unreliable thing, and is apt to throw a very ambiguous light upon those higher ranks who would set their hopes thereon. The assailant, on the other hand, has certain important advantages which he can set off against those of the defender; all of which he must give up if he wishes to attack by employing his forces in succession. The assailant has this advantage at the beginning, viz., that he is master of the strategical situations, in so far at least, that this advantage consists in his being able to take the initiative.

Under certain conditions, he possesses the hope of being able to get at the enemy before the latter can have finished concentrating his forces, and of placing him in a very disadvantageous position as regards his line of retreat. He is able under all circumstances to make one of the defender's two flanks (and these are always his weak points) the object of his attack. All this urges him to rapidity and to exert all his force at the same time; for otherwise the defender gains time to oppose a front where the assailant would expect to find a flank.

He possesses also while doing so, the means of securing himself everywhere against attacks on the part of the defender. He can also, if he has only a certain amount of information as to the position of the defender, send from the first, such a powerful force against any single point of the enemy's position, that in all probability he will be able very quickly to get hold of it, and by so doing, he will, without having cause to fear any counter-stroke on the defender's part, perplex the whole of the defender's system most thoroughly.

It is very essential that care should be taken to follow up these first advantages, the situation which has been won must be rapidly secured against any attack which the hostile reserves may make against it, and then let the utmost be done to reap the full advantage from the success which has been gained. Means for this will be at hand. The movable mass of artillery and the

judicious use of the cavalry, constitute the means and the force which the assailant has for this purpose.

The movable artillery mass must be equipped in such a manner that it may operate just as effectively against those troops of the enemy which are in the open field as against those which are concealed in villages, plantations, redoubts, etc., or by the undulations of the *terrain*, it must therefore consist of large cannon and howitzer batteries according to circumstances. There was nothing in all these tactical demands which smooth-bored ordnance was not quite competent to perform, and it was only by utterly ignoring the artillery mass as a most potential tactical force, that the above system still existed in the text-books as the exclusive one.

We have now to do with certain capabilities of the artillery mass, which we must consider more fully in a section devoted exclusively to that subject, and which favour the guidance of the battle equally with the depth of position.

These capabilities are now neither new or have they to be discovered, least of all for a *terrain* which is quite open to the effect of shot and shell, but are always available, and have been so, whenever the assailant was cognisant of his whole strength, and so long as he had a movable artillery available, even in those cases where the general's dispositions presumed that the artillery was more movable than it proved itself to be, as was the case in Frederick the Great's battles at Kunersdorf, Torgau, etc. His instructions leave no manner of doubt on the subject. When we come to examine carefully the prolonged struggles which took place in the battles of Napoleon, which were kept up in order to enable him to obtain information, or until the arrival of some expected corps on the field of battle, or some out-flanking movement had been made, we shall see that everywhere the attack was developed to its utmost powers without taking into consideration the number of the enemy's reserves which were intact.

We might be inclined to give Bautzen and Ligny as instances

of the methodical fights of Napoleon. Certainly if we omit the consideration that in the first of these battles Napoleon waited for Ney's decisive flank movement, and in the second for the arrival of Erlon's corps on our (the Prussian) right flank, and if we overlook the fact that Ney mistook the direction of his attack,* that Erlon never appeared at all, then surely the character of these battles devolves gradually into that of an exterminating duel, which was only decided by the final blow of the last reserve, and Ligny may be cited more especially as an example of this kind. But we should be under a totally wrong conception, should we be inclined to deduce therefrom that Napoleon preferred this plan of fighting in his last campaigns. At Ligny, Erlon's original approach gave Napoleon this advantage, viz., that it drew the Prussian reserves to the right flank, and Napoleon made a masterly use of this by breaking through their centre.

Had Erlon's movement, as it was really carried out, been Napoleon's own idea, had he only intended to threaten with it, in order that Blucher might be induced to send his reserves to meet it, whilst Erlon then moved off to make Quatre Bras a decisive action, we should then have every reason for considering the battle of Ligny, looked at from the French side, as a "manœuvre battle *par excellence*." The battle would then have been engaged in protracted combats, *i.e.*, would have remained in the preliminary stage until the withdrawal of the Prussian reserves to the right flank gave the opportunity for a decisive attack upon the centre. But as the circumstances really were, the piercing of the centre was a happy improvisation, it was the attack of the last reserve which remained intact, against which the defender had nothing to oppose; but at the same time the assailant, who was utterly exhausted, was quite unable to reap any benefit from it. But how different and how much quicker would have been

* According to Colonel Hamley, Erlon had actually become engaged with the Prussians when he was recalled by Ney to assist him at Quatre Bras, where he did not arrive till after midnight, too late to be of any assistance.

the result, had Erlon's corps rolled up the Prussians—who were straining their utmost to maintain their front—from the right flank. That would have been a manœuvre-battle thoroughly well brought about by the preliminary strategy.

But how blind is that theory which, taking as examples such fortuitous circumstances, would instance battles in which each side successively endeavours to destroy the other, up to the final blow of the last reserve, as a pattern to be followed on all occasions. Experience in fighting battles such as Napoleon had, is required, in order to win a victory such as Ligny, even with Erlon's corps wanting. What becomes then of calculation? On every occasion when Napoleon had his forces together at the commencement, as at Austerlitz, Wagram, Borodino, Waterloo, he threw such an overwhelming force against the key of the position that, if certain events had not frustrated the design—as at Borodino and Waterloo the inefficiency of the first batteries owing to want of howitzers—such a powerful alteration of circumstances was brought about that very little doubt remained as to the result. Napoleon, like Frederick the Great, knew that where it was a question of producing an effect upon a mass of men, it was not necessary to proceed as if each individual were to be affected, because the fright which seizes on a portion soon permeates the whole mass like an electric spark. It is in this respect that we find the difference between the methodical fight and the more forcible methods of the two greatest generals of modern times, shown in the clearest and strongest manner. It was in this that the justification of the first manner of fighting in the wars of Liberation, and of the preponderating employment of skirmish fighting in the French revolutionary wars, lies; as it was by this plan, that as many combatants as possible were brought into immediate contact with their opponents. These, however, are not normal circumstances. Though in principle the same, Napoleon's battles differed from those of Frederick, as we have already shown, only by the alteration which had taken place in tactical forms,

and by the other scale which was brought about by the numerical increase of armies. Even the attack against the enemy's centre, which he so often made use of, was only a modification of Frederick's maxim, "To bring one's own strength against the enemy's weakness," and is only permitted where these conditions can be fulfilled in the highest degree (as at Austerlitz, Ligny).

There is this objection to be made against that method of attack, and not only when it was obliged to be carried out with line tactics, as was the case with Frederick the Great—viz., that once the order is given which sets the army in motion against the enemy in the disposition previously alluded to, properly speaking the decision, and then the direction, is no longer in the hands of the commander; and everything depends upon the courage and tactical discipline of the troops, as well as upon the behaviour of the enemy.

That this, owing to the present manner of fighting and organisation of armies, is no longer so much the case is quite evident. But on what does the decision in the methodical fight depend? Not only on the courage and discipline of the troops and the behaviour of the enemy, but, besides this, on the good will, the adroitness, and the intelligence of the common soldier, and of the junior leaders, as these alone can properly supervise the economy of their forces. It was just this good will to which the success of the struggle in 1813 was due; and which must supply the place of intelligence,—but at what sacrifices. And is it wise to suggest that from such experience a system based upon it should be held up as a method? A system in which, moreover, such an enormous means of power—as the artillery and cavalry mass as a united, and at the same time as a latent force, which could only be set free under peculiar circumstances—was neglected.

But such is actually the case in the methodical fight in which, so long as smooth-bored ordnance still existed, the artillery mass was only capable of being effective at the decisive moment.

Before this time there was nowhere any object for it to direct its fire upon.

The skirmish fight is being carried on in every direction; the masses are kept in the background and avoid coming to the decision, because they have not yet measured each other's strength. There will be, of course, certain foci of the fight; but its immediate object at first is only to bring about a mutual weakening; at the most, through some small though powerful *coup* a more advantageous fighting situation may perhaps be obtained; but the greatest care is necessary in doing this, for it is exactly the economy of force that decides the day. Too much importance must not therefore be attached thereto, in order to be able to hope that finally there will be a greater force available than that of the opponent. This naturally applies to the artillery, which will have become much dispersed by these single combats; and just as much to the cavalry, which must be omnipresent, in order that the full effect of any partial successes may be reaped. It is therefore not to be wondered at that, with a few unimportant exceptions, there is hardly any mention of the deeds of these two arms in the course of the campaigns of 1813–14–15, and that, with all their distinguished deeds in small detachments, they did not succeed in winning that glittering crown which warmed with its refulgent rays their younger brethren-in-arms, and raised them to that noble self-reliance in the force of their arms which is so necessary. The artillery, even on those occasions where it really performed insurpassable service, as at the battle of Bautzen, did not even receive from the German tacticians, that acknowledgment which their opponents would not withhold from them. For, it was it alone, which, in this battle, parried that blow of Ney, which would otherwise have brought disaster on the army.

The true economy of forces consists in employing them in a suitable manner, based upon their being thoroughly competent. Each arm should have its sphere of operations thoroughly explained to it, and each must give the other support.

And what have been the results of bringing up troops in succession, when it has been done piecemeal? Let us compare Gross Beeren with Mockern. What a difference! Certainly both battles were won; but how different was the loss of the victors in each case. Look at Auerstadt and Gross Görschen (as long as Ney's corps was opposed to us), where a superior number of brave troops expended themselves, in making one effort after another against a smaller number. And then Dresden, where, owing to the feeble efforts of the Allies during the first days, Napoleon had time to bring up his guards, etc. How clearly does Ligny show the weakness of this method of fighting against an able adversary. One Prussian brigade after another was thrown into the thick of the fight, and was immediately ejected like the burnt-out slag of a furnace. The assailant, who was originally the weakest, had, at the finish—although he dispensed with the protection which the ground might have afforded him—more troops prepared to decide the battle than the defender, who was originally stronger.

The greatest value of the methodical fight will be found not in the attack which is seeking to decide the battle, but rather in the *defence;* and more especially where it is a question of gaining time, consequently in those "feeling" attacks which it is to a certain extent necessary that the assailant should make in order that he may have time to concentrate his forces; to ascertain the enemy's position; to await the effect of a flank movement; and to lead the enemy astray, so that he may be induced to send his reserves to other points, *i.e.*, consequently for the commencement of the battle. He requires them (the reserves) also to support that attack with which he is endeavouring to decide the day, in order that they may keep the enemy's forces well in check; so that they may be prevented from hastening to that decisive point which has been attacked. After what has been said here, it is almost superfluous to remark, that the theorists of this period considered the defence as being without exception the strongest form.

2. *THEORY OF FIGHTING, MORE ESPECIALLY AS RELATING TO THE ARTILLERY COMBAT.*

GENERAL CONSIDERATIONS.

THE Crimean war was especially fitted to lead the German literature into the right path in this respect. In the battles which took place there, the mighty power of fire, whether of artillery or of the skirmishers, and mass-fire of the infantry, as opposed to the habitual attack *en masse* of the Russians, was evidenced in the most irrefutable manner, as was also in a much greater degree, the necessity for preparing the attack by a sufficiently powerful fire of artillery. The results of an insufficient preparation by artillery fire were shown in the most striking manner. On the other hand, the Allies employed their artillery on perfectly correct principles. The German theorists were, however, still blinded by their belief in the authorities (*autoritäten glaube*). They did not succeed in finding a formula which would place the attack on the same footing as the defence. The opinion that the defence was the strongest, and that the only chance of success which the attack could have would be in gradually destroying its opponent, remained as steadfast as ever. What mainly contributed to this theory was, that when considering it, infantry fire alone was taken as the starting-point; although, however, it is not capable of overcoming the advantage which the defender possesses of opposing to the assailant, the difficulties which the ground occupied by him presents.

It is here that artillery, and especially a most powerful shell-fire, comes into play. Rifled ordnance would have but slightly improved tactics had not the possibility of using shells presented itself at the same time.

That method of fighting which is based solely upon infantry fighting, is not only unpractical and quite illusory as to its results, when the preliminary measures are being carried out, but throughout the whole course of the fight, especially after the reaction which follows the assault, or the disorder which follows an unsuccessful attack. The author has in the following

remarks set this task in front of him, viz., to base the theory of the fight upon the combined action of infantry and artillery. On the other hand, care should be taken to avoid the subject of cavalry being brought into a purely theoretical discussion, although in the battles of the present day situations may occur where cavalry would be the only arm suitable for them. This will be referred to later on.

As the previous section, however, has laid down the general features of fighting, and shown the artillery mass its place in battle, we shall now proceed to keep the efficacy of artillery especially in view, while pointing out the part which the infantry will take.

Rifled artillery will not yet be considered, in order that the course of the historical development may not be interrupted, and that its importance and influence may appear all the stronger later on.* This has no great effect upon theory in general, as it chiefly contents itself with the effect produced upon the object, which, owing to the general employment of shells even at the time of the Crimean war, was not materially inferior to what it would have been had rifled ordnance been used. The author, however, wishes to be debarred emphatically from imagining that smooth-bored ordnance could have been as efficacious in 1870, as the artillery which took part in that campaign. The long range and great precision of rifled guns was necessary for shell firing, so that should the *terrain* not permit the guns to take up a closer position they could remove farther off, and yet still retain their efficiency.

In the following pages then it must be premised, that the artillery was simply that in use at the time of the Crimean war. It was capable of such energy in its working, and of being so independent in its action on the *terrain*, as well as of being moved and manipulated with such ease, that, in conjunction with the

* As has been already remarked in the Introduction, the First Part was written in the year 1856, consequently immediately after the Crimean war, a fact which should not be overlooked in this section.

infantry fire, it may be said to have taken the power of deciding the fight upon itself, in so far as it was in a condition to make the opponent defenceless. The determined advance, the threatening him with a combined blow, was now all that was necessary in order to induce the opponent to yield. The secret of modern tactics consists really in this interchange of fire-fighting and shock, as the advance must on its part again move onwards, always ready for firing, in order to be secure against the assaults of the hostile reserves.

The Relation between Fire-fighting and Attack, and its Influence upon the Method of the Fight.

WE can always make use of the old expression which says that the decision is brought about by the combined attack, *i.e.*, in threatening with the same, by means of the determined advance of our troops after the utmost effect had been obtained with their firearms. The seizing and occupation of the hostile position which has been made defenceless amounts to the same thing. The act of preparation, *i.e.*, the demoralisation of the hostile forces, devolves upon the firearms. This seizing and holding a position is indeed fraught with the most productive results, but we must be thoroughly aware what is meant by this, viz., that the decision itself is generally an act without fighting. The fight, *i.e.*, the mechanical influence which both sides have exercised upon each other, has already exhausted itself in the fire-fighting, and the meeting of the hostile bodies only takes place in the pursuit, *i.e.*, in the act of annihilation, with the one-sided effect of the one upon the other, consequently here there is no longer any real fighting. These are no theoretical subtleties, but extracts from occurrences of the wars of a whole century, and, if one wishes to have it put in such a light, the influence of human intelligence upon material.

It is only thus possible to go into action with any amount of certainty as to the result, to control the fight, and to discon-

tinue it should circumstances require it. Wherever in modern wars the battle has been arranged on a different plan, it will only appear, with the exception of struggles for the possession of localities, as the crude utterance of an untameable courage.

We do not, however, depreciate that high moral courage which animates those troops who throw themselves honourably into a hand-to-hand fight, but without proper preparation by fire there is no chance of success.

With regard to Inkerman, it may at all events be alleged as an excuse that a surprise was intended, but no whole army corps can be surprised by infantry alone; it is only strong posts that can be taken in this way. For a surprise on a large scale we must have cavalry, and a great deal of it.

But on the Czernaja, when the moment of surprise completely failed, or at least it cannot be deduced from the dispositions of the commanding officer that one was intended—there was no earthly reason why the action of fire should have been neglected. The French gave way everywhere most elastically, but only in order that the greatest effect might be obtained from the fire, which was then quite sufficient to send the enemy flying back much quicker than he had advanced. This endeavour to base the result principally upon firearms, and what is to a great extent connected with it, viz., the withdrawing of one's own forces as much as possible from the effect of the enemy's firearms, shows itself nowhere more prominently than in the behaviour of the French in the Crimea, and it must be acknowledged that it is the culminating point of modern tactics. All assertions to the contrary are useless. The Russians, on the other hand, appear to have followed a diametrically opposite principle, and in the most exaggerated manner, at Kars.

But we do not intend to urge that hand-to-hand fighting is to be proscribed. When fighting for the possession of localities, it must always become allied with fire-fighting, so long as the latter has not attained the power of sweeping everything

down before it; and where, as when fortresses are being besieged, men are exposed to a heavy fire, the effects of which the besiegers will endeavour to avoid by taking advantage of the night, it will always form one of the most essential tactical means; but, on account of the uncertainty of its results, it must also always be acknowledged as a necessary evil. The firm determination to come to a hand-to-hand fight must, however, exist amongst the troops under all circumstances; because, in its deliverance in the attack, it is the necessary supplement to the result of the fire-fighting. The fire-fighting must take care to prevent the enemy's attack from coming to a hand-to-hand fight. The simple action of the firearms is in itself, at least on the part of the assailant, insufficient to bring about a decision.

Under certain circumstances, it will lead immediately to a decision, as in sieges (Kinburn, etc.), or when there is great moral superiority, as in the battles of Ocaña and Temeswar, etc. But generally the decision will be obtained by taking full advantage of the effect of the firearms, by means of the attack which should follow immediately after. We lay particular stress on the *immediate*, as the results of the fire-fighting do not consist so much in the material losses which have been inflicted upon the opponent, as chiefly in the breaking up of the tactical order, and in the moral effect which make him defenceless for the moment.

Passive resistance against fire effect may go on for a very long time; but the active effectiveness of troops which have suffered considerably from fire is soon exhausted.

The right *tact* in the interchange of fire-fighting and attack, the knowledge as well, if circumstances are such that the attack may be made, as to how far the latter may proceed without weakening one's own tactical order to such an extent, that the troops would be unable to reform rapidly for defence, should circumstances require it; consequently the power of deciding on that moment when the fire-fighting must be again resorted

to—this *tact* is to a great extent a matter of experience in war.

In the fighting of to-day we find consequently that, besides the introduction, and what is connected therewith, there are three principal acts—the act of demoralisation, the act of decision, and the act of annihilation—the first of which consists without exception in fire-fighting, and is the real battle; the second generally comes off without fighting, and with the simple outspoken determination thereto on the one side; the third discharges itself in the pursuit, and frequently subsides completely in doing so.

On the part of the attack the act of demoralisation may be carried out either by the artillery alone, or else by the infantry with the co-operation of the artillery, accordingly as it is intended to overwhelm the enemy with powerful blows, or to overcome his forces gradually, in order that he may be completely overwhelmed by a reserve which has been kept fresh for this purpose.

In the first case—the overwhelming by means of powerful blows—the artillery will fight as an independent arm, protected alone by the others; in the other case—the gradual overpowering—it then becomes only an auxiliary arm to the infantry, but keeps a reserve for the act of decision. This latter constitutes a fighting situation of itself, in which the artillery takes on itself the duty of the act of demoralisation.

It strikes us immediately, that we are dealing with the two methods of fighting which we have repeatedly encountered in the course of our review of the history of the development of modern tactics—manœuvres and methodical fighting. We say also, in this general comprehension, manœuvres, because the circumstances would be quite exceptional where the artillery could carry out the act of demoralisation with the intention of making the entire hostile army their object; and that then the shock *en masse* of the other arms should follow. Owing to the size of the armies of the present day, it will be much more likely

to select one integral part as an object, which, owing to the superiority of its fire, it would probably be able to demoralise, and the attack *en masse* must be confined to this part. Consequently a partial overpowering of the enemy can only take place, and a second act of demoralisation must then follow. It will be necessary, moreover, to occupy the attention of the remaining parts of the hostile army at the same time, in order to prevent them from coming to the assistance of that point which has been attacked, with overwhelming force; and this can only be carried out by the help of the methodical fight, as it will no longer be possible to oppose a superiority in power of fire. Viewed scientifically, these sham attacks must be excluded from our consideration, as quite indifferent with reference to our subject.

The idea which is conceived of the acts of demoralisation and decision, when the conditions attending the fight are quite simple, cannot be laid down so clearly, when brought to bear upon affairs which are on a much larger scale; but that this, nevertheless, does occur, has been to a great extent the cause that literature has taken the curious direction which I have previously pointed out.

This is what happens in the case of the methodical fight. The assailant who makes use of it will first of all make the entire hostile army the object of his attack; but he will only stake a portion of his own forces, generally a third. A second third will be employed in supporting and sustaining the fight during the course of the demoralisation act; while the third part is kept in hand for the decision. This latter third part is intended for the attack *en masse*. It should not, however, be adduced from this that firing is the only thing to be done during the act of demoralisation. As the results of the fire-fighting should be reaped immediately, the supporting parties must always push their way forwards; and the whole act of demoralisation in the methodical fight is a continual interchange of fire and attack, always *en avant*.

This is exactly what infantry fighting consists in, skirmishers

and columns firing and advancing, neither of which must be inferior to the other.

Reinforcing the fight by the second third during the act of demoralisation has been regarded by theory much too prominently as a feeding of the fire-fighting, and has in consequence led to quite erroneous deductions. In passive defence, and in sham attacks when it assumes the offensive, feeding of this kind may take place with great advantage; but, on the other hand, the assailant must not make use of it.

With regard to what concerns the defence, we have here nothing to do with the passive defence, as it does nothing else except carry on fire-fighting. It may under certain circumstances succeed in repulsing the enemy by this means; the acts of demoralisation and decision, will then be carried out exclusively with fire-fighting, as would, under certain conditions—as for instance in an open plain—be the case with the attack. In the case of the active defence, fire-fighting carries out the act of demoralisation, the attack that of decision, and as this can be done by surprise, it is capable of the most favourable combination of fire power and attack.

The difficulty consists in judging the right moment when the blow should be given, and where it—*i.e.*, the reserves—should be directed. The suitable combination of fire and attack is what will bring about the decision in the attack, and as the dispositions, for it may be previously made in such a manner as to make this feasible, and not as in the case in the methodical fight, where the suitable combination of fire and attack does not ensue until during the course of the fight, and especially where it does not lie at the immediate discretion of the general commanding, therefore, the "manœuvre" is in this direction the most advantageous method of fighting, but it is above everything contingent on the *terrain.*

There is, however, another most essential factor which must be added to the above. The greater the range of firearms becomes, so much the more difficult does the suitable combination of fire

and attack at once become, on account of the greater distances which have to be traversed ; but, secondly, the more important does this suitable combination become, because, owing to the greater precision of the firearms of the present day, an attack without a sufficient preparation by fire-fighting, would not have the slightest chance of success. At the first consideration, it would therefore appear as if small-arms would, when compared with guns, admit of a better combination of fire and attack, because their sphere of operation is always more confined than that of artillery, and the masses prepared to make a charge would consequently have a much less distance to traverse.

This would not, however, be absolutely the case when it is a question of more extended fronts. Speaking for itself, it comes to nothing when artillery takes part in the fight, as it entails the infantry mass keeping a good distance off. Should the fight be between infantry only, this presupposes the *terrain* to be so *coupé* and to afford cover to such an extent that it would be impossible to oversee or to manœuvre large masses of infantry. The supervision of the fight would be completely withdrawn from the person in chief command.

The assuming the initiative for the attack, in order to reap the immediate benefit of the fire-fight, is much more likely to be entrusted to the company commanders, or to those commanders who, influenced solely by the fight in their immediate vicinity, easily lose sight of the fighting object of the whole body. Such partial blows are then of no value, and are liable to lead those making them into unfavourable conditions, as they are deprived of continuous support, and now, in their turn surrounded by the enemy, are exposed to a destructive fire.

It follows therefrom that the defender will seek for *terrains* of this nature, in order to render his opposition more determined ; the assailant, however, should avoid them. The latter should much rather be directed to choose that point which he intends to attack with overwhelming forces, so that he can keep the command of his force well in hand, that he may preserve that body

of troops with which he intends to make the blow intact; in other words, so that he may carry out the act of demoralisation as much as possible with his artillery. It is only thus that a suitable combination of fire and shock can be carried out.

We shall now proceed to glance back at the capability of artillery for carrying out almost exclusively the act of demoralisation.

It is solely by means of history that this glance can be made, and then we can only examine the motives therefor from a theoretical point of view. At the same time it will also form the foundation of that which we have only been able to point out in the course of this historical summary.

(*b.*) HISTORICAL INFORMATION CONCERNING THE INCREASING IMPORTANCE OF ARTILLERY WITH RESPECT TO THE CARRYING OUT OF THE ACT OF DEMORALISATION AND TO THE CONDUCT OF THE BATTLE.

Frederick the Great.

IT will be sufficient to begin at that time when field artillery gained a superiority over the small-arm, and this occurs in the course of the campaigns of Frederick the Great.* In the battles of both the first Silesian wars the act of demoralisation devolved almost exclusively upon the infantry; at Mollwitz and Czaslau the decision also.

Later on, the cavalry undertook this latter act (Hohenfriedberg). Personal encounters took place amongst the cavalry alone, and then only on rare occasions.

The heavy artillery was scattered singly along the whole front like the battalion guns (at Hohenfriedberg, each infantry regiment had, besides the battalion guns, two twelve-pounders attached to it), and was only massed, in batteries of twenty guns and howitzers, on the flanks of the infantry for the purpose of

* We might have followed a similar appearance in the course of the campaigns of the Maréchal de Saxe, who, after the battle of Fontenoy, likewise made a more extended use of his artillery; and it should be observed here that his rêveries, where he wishes his heavy artillery to be drawn by teams of oxen, had been written long before this period.

strengthening these weak points, and for assisting the cavalry fight (Instructions of August, 1744). The infantry worked up firing by files (*peloton*), and with their battalion guns to the enemy, who, by this means, became demoralised and did not await the onslaught with the bayonet, or else, as at Hohenfriedberg, succumbed without resistance to the cavalry onslaught. The superiority of their musket and the tactical discipline of the Prussian infantry adapted them especially to this employment. The actual act of annihilation was, owing to the complete dispersion and loss of cohesion which the victors also suffered, confined entirely to the battlefield, and was consequently only partial. Pursuit was not so much as heard of.

It was quite different in the earlier battles of the seven years' war. A numerous artillery, dispersed in batteries along the front of the Austrian infantry, made the efforts of the Prussian arms of no avail.

The Prussian cavalry found this to be case at Lowositz, the infantry at Prague and Kolin. The latter were so little prepared for a reception of this kind that in the first battle at Prague the left wing of the Prussian infantry did not think it worth while to wait for its artillery, which had remained sticking in the mud. They assaulted without artillery, and were consequently repulsed by the Austrians; they then reformed under cover of the batteries, which meanwhile had been brought into action; and returned to the assault again.

Just as little thought was given to the artillery at Kolin, and a disastrous result ensued. Moller then proved its value at Rossbach, and the grumblers of Leuthen made such a lasting impression upon Frederick that, when awaiting an attack from the Austrians in his camp at Olmütz, he issued the memorable instruction of the 30th June, 1758 (*vide* Appendix), which in all subsequent battles was the maxim for the conduct of the artillery. What had previously been done by the infantry fire was now entrusted entirely to the artillery.

Sixty heavy twelve-pounders and twenty-four-pounders were

to advance against that hostile flank which had been chosen for the point of attack until they were close enough to fire case; and were then to complete the demoralisation. Certainly, the heaviness of his artillery did not in every case enable the King's intention to be carried out. The heavy calibres, which had additional horses attached to them, were left sticking in the lurch at Zorndorf* by the peasant drivers as soon as they came within the effect of the enemy's fire; and at Kunersdorf they were not able to follow into the enemy's position after this had been opened up by the infantry.

At Torgau the column of heavy artillery was crossed in its march to the point of attack by other columns, and when it finally arrived there was immediately rendered inactive, as the Austrians had had time to put a much more powerful artillery in position. The King had, however, in his disposition for the battle, laid especial stress upon the importance of these guns. "Colonels von Dreskan and von Moller," he says in his instructions, "must cause some cannon and howitzers (*würfgeschütze*) to be brought up in order to facilitate the attack. As soon as the enemy shall have been driven from the heights of the Rathwein, the heavy batteries must advance there at once, and the battalions must reform." We pay especial attention to the progress which had evinced itself in the King's views with regard to the employment of artillery. The artillery was not only to prepare the fight, but to follow into the hostile position which had been won, in order to meet any hostile attack, give the infantry time to collect themselves, and then to commence the work of demoralisation afresh. The reflexions on Kunersdorf, may have led him to issue these instructions.

The King's views, however, went further. He said to himself that the artillery was not only casually to prepare the victory, it must also be adapted so as to be able to search out the enemy where the *terrain* concealed him from view, or the cannon from

* *Vide* "Mobility of Field Artillery," by Captain Hime, R.A., No. II. "Proceedings R.A. Institution," vol. vii., p. 143.

other reasons were insufficient to do so. He consequently increased his howitzers to an extent previously unheard of, and they constituted one-third of the whole of his artillery. He was aware that with artillery, it was by the massing of his guns that he would produce a decisive effect; and that he knew how to employ them in this way was shown in the battle of Burkersdorf, July 21, 1762, and by his instructions of the year 1768. Just as well known, is the stress which he placed in the years of peace that ensued, on the importance of perfecting artillery fire, and of knowing how to work it properly.

It is self-evident that the riper ideas of the King on the employment of artillery, led him to improve its material and organisation. Apart from his endeavours in the first Silesian wars to establish a light battalion gun, and a more efficient flying gun to prepare the cavalry fight with, the experiences of the year 1758 showed him the necessity for reducing the weight of the heavy guns. In the winter of 1759 he adapted the Austrian light twelve-pounder (very similar to the shell-gun of Napoleon III.); but in consequence of the alteration which he introduced into his system of carrying on war, which led him in his last campaigns to avoid decisive battles, he returned to his more effective heavy twelve-pounder, but retaining at the same time the lighter one.*

In the course of the campaign of 1759, the creation of horse artillery was one of the results of his improvements, and the value of a movable artillery, even for the defence, was most clearly proved in the battle of Reichenbach on the 16th August, 1762. Its appearance in this battle, quite answers our ideas as to the employment of reserve artillery in the defensive battle.† The organised union of heavy guns in batteries of ten pieces

* Frederick also employed a twelve-pounder chambered gun, which was called a light twelve-pounder; the Austrian gun, on the other hand, was called a medium twelve-pounder.

† A most interesting account of this horse artillery will be found in "Mobility of Field Artillery, Past and Present," by Captain Hime, R.A., in vol. vii. of the "Proceedings R.A. Institution," p. 455, etc.

each, and their being attached to the infantry brigades in the order of march, which ensued in the year 1760, produced the most blissful results in the battle of Liegnitz.

That the King did not, while doing this, alter his views concerning the employment of artillery *en masse*, is quite evident from his instructions of the year 1768. It was the conditions connected with the order of march, that he had chiefly in view in carrying out the above organisation, and this was proved most advantageously at Liegnitz. Those who wish to show that in this organisation lay the first prominent division of siege from field artillery are wrong, as it had occurred long previously with the French.*

The great numerical increase of guns, each individual battle in the last campaigns of the seven years' war, as well as all the later instructions of the King, are conclusive proofs that Frederick the Great had become convinced that the act of demoralisation should be carried out exclusively by the artillery. And we think that we have shown how circumstances gradually imposed this upon him.

It is therefore extraordinary that, if blinded by the individual performances of a movable artillery of a later period, we look scornfully upon the unwieldy heavy batteries of the King, as if they were made of quite other stuff, and had arisen from quite a different combination of ideas than those which will remain standard for all times. No one had recognised the effect of employing artillery *en masse* like Frederick, and it is in this that, as we shall see farther on, the possibility of artillery carrying out the act of demoralisation by itself consists. The artillery is certainly not capable of crushing the whole hostile army with one *coup* in such a manner, that all we have to do, is to make an onslaught with our forces. It can, however, take a considerable part of this task upon itself, it should then follow the other arms into the enemy's position which has been won, and immediately prepare for a second act of demoralisation should the first not have been sufficient.

The King's instructions leave no doubt as to this method of

* Bardet de Villeneuve, Cours de la Science Militaire. A La Haye, 1740.

employing artillery, only, as already remarked, the want of mobility of the heavy calibres was frequently the cause of the King's expectations being disappointed. In addition to those previously quoted, the instructions issued on the 3rd May, 1768, are interesting in this respect where they concern the employment of howitzers in attacking heights. "The whole of the howitzers (forty ten-pounders and eight or ten twenty-five-pounders)," it goes on to say, "must be brought to that place according to that one of the enemy's flanks which is to be attacked, ... and the artillery officers must direct their fire so that the fire from all the batteries shall be concentrated right upon that spot where the attack is to be made, ... and the howitzers must, when the enemy has been driven away, follow him up; and it must be the chief object of the artillery officers who command these batteries, to concentrate them on the second place as much as they did upon the first, and bring a cross-fire to bear upon the heights with the batteries which surround the position."

With these results we shall now pass to modern times where a more movable artillery was enabled to execute those designs which had already lain perfected in the King's ideas. Putting aside the employment of howitzers *en masse*, the importance of which was ignored by Napoleon, and for which he was severely punished, we find him making the same discoveries, and arriving at exactly the same fundamental principles with regard to the employment of field artillery, as Frederick the Great.

Napoleon I.

NAPOLEON found very little artillery in the French armies when he was appointed general. It was by the infantry that the battles of the Revolution were fought out, in it alone did the revolutionary element become satisfied through individual exertions.

It was here that skirmish fighting received its natural origin, and had its most extended employment. Nevertheless, Napoleon turned the little artillery he had, to excellent use in his

Italian campaigns. They worked in small united masses at Lodi, at Castiglione, and at Rivoli, and were most efficacious at those decisive moments when the other arms were about to attack; *i.e.*, to such an extent that there was no occasion for any actual encounter to ensue; much more, the enemy gave way before the mere pressure. But even here he did not succeed in grasping the proper conception of the actual vocation of artillery.* The battalion guns certainly disappeared, but the splitting up of artillery, which, owing to organisation, had become systematic, still continued. It was only an auxiliary to the fighting objects of the other arms; and even when he took the reins into his own hands, and undertook the magnificent organisation of the *corps d'armée*, we still find no trace of a higher perception of the efficacy of the arm, although Marmont, as commander of the artillery of the Italian army (Brune) in the campaign of 1800, had pointed out the road by the establishment of a numerous reserve artillery. The whole of the batteries were assigned to divisions, the so-called park, the reserve, existed only in the dépôts, in order merely to replace an expenditure, etc., of the field artillery, and was generally only formed during the course of the campaign. The batteries themselves were composed simultaneously of howitzers, light and heavy guns (two six-pounder howitzers, two twelve-pounder and two six-pounder guns).†

The imperfections of this organisation evinced themselves in the most striking manner in the battles which ensued. When the preparations were being made for the battle of Austerlitz, the establishment of a heavy battery in front of the left wing of the position (on the so-called Sauton) was considered necessary, the twelve-pounders were obliged to be withdrawn from the divisions,

* Napoleon could not help saying at Marengo of Dessaix: "Cest ainsi général que l'on perd les batailles. Il nous faut absolument un bon feu de canon." "Mém. du duc de Ragusa," p. 132.

† Or else two five-pounder howitzers, two eight-pounder and two four-pounder guns.

and when Soult, in the same battle, ascended the heights of Pratzen, he took with him for this decisive blow, only the batteries of his own division.

The attack succeeded this time because the Russian-Austrian reserve, which was exactly here, had no artillery at hand, with the exception of the battalion guns, and a battery of Austrian horse artillery. But when Angereau's corps acted with similar indiscretion at the battle of Eylau, and was cut to pieces by the Russian artillery;* when the same thing happened to Marshal Ney at Friedland, who with his corps formed the first part of the right wing, and it was only owing to the brave Sénarmont, with the divisional batteries of Victor's corps, which he brought up in the greatest haste, that his advance was set going again—then the Emperor acknowledged that there was another element in the artillery than that of being tacked on to the other arms, and made subservient to their fighting objects, and that it possessed the power of demoralisation in its own self.

The battle of Aspern was to give him a new and bitter proof of this fact.† Here lies the actual turning point. The period which elapsed between the battles of Aspern and Wagram appears to have ripened his ideas. The number of guns which he collected to cover the passage of the Danube, the magnificent employment of his artillery in the battle of Wagram, and the alterations in its organisation both before and after this battle answer for this.

Napoleon, by the reintroduction of the regimental artillery, increased the number of his guns by one-third, and raised the ratio from two guns per thousand men, which had hitherto been the proportion in the French armies, to three per thousand.

Further, by a numerous increase of the batteries of the guard immediately after the battle, he created a central-reserve artillery of 126 guns, and by degrees gave each *corps d'armée* a reserve artillery. The French corps appear to have been pro-

* As far as is known this corps had to be dissolved after the battle.

† Lannes' corps was likewise nearly destroyed here, the Marshal himself was killed.

vided with a reserve artillery for the first time, in the campaign of 1812.

The idea of employing reserve artillery in opposition to the divisional artillery, and what was equally important as originating therefrom, viz., the idea of employing a mass of artillery, once grasped, must necessarily be greatly to the advantage of the defence, and especially when repulsing the enemy's main attack. As instances of this: Sorbier's great battery at Semonoffskoi towards the close of the battle of Borodino; Druot's great battery between Caja and Starfiedel in the battle of Gross Görschen; and the great batteries brought together in the defensive battles of Wachau and Leipsic (Probstheide).

It is curious what strange notions have been entertained with regard to ideas. It appears as if there were a wish to ascribe the increase of artillery which took place in the later campaigns of Frederick the Great, as well as those of Napoleon, to the increasing weakness of infantry, and yet in both instances infantry then stood at the summit of its fame. There must have been a heartfelt, no mere passing conviction of the necessity therefore, which caused these generals to carry this out. It was occasioned first of all, no doubt, by the increase of the opponent's artillery. But it had the effect of turning more attention to the importance of the arm, and can hardly be said to have been the deciding principle which conduced to this change.* We shall return later to the more deep-seated reasons.

Napoleon, however, did not come up to Frederick the Great in the careful observation of artillery.

We find that he created nothing like the horse artillery and

* Frederick the Great writes in his well-known letter to Fouqué: "We must espouse the system of a numerous artillery, however inconvenient it may be. I have considerably increased ours. It will supply the want of infantry, which we feel will become exhausted as the war becomes bloodier and more protracted." That the King had more material grounds is simply evident from this fact, that in the Bavarian war of succession he maintained a numerous artillery. In addition to this, we have shown in the foregoing pages the particulars of the matter.

the howitzer masses. Napoleon did not even profit by the lesson which the performances of distinguished artillerists like Marmont and Senarmont might have taught him. The mobility of Senarmont's batteries at Friedland and Ocaña was the work of organisation and training, but no thanks were due to the Emperor for it.*

Senarmont had made a field exercise for himself and had trained his own regiment thoroughly in it. So little attention, however, was paid thereto, that two years later at Wagram, owing to the inability to manœuvre, the success of the great division of 100 guns was frustrated. Do not let it be urged, that, generally speaking, this would be impossible. Future wars will prove sufficiently the necessity for establishing batteries of these dimensions under similarly grand circumstances. Of course there can be no question as to directing such a mass with a wink or a sign, but it is quite clear that where one commander can lead four batteries, another will be able to place four alongside of them. But it must be immediately one after the other, and both commanders must receive their instructions from an officer of superior rank. The extent of this mass will depend entirely upon the importance of the fighting object, and on this, that it is sufficient to overwhelm in a short time the actual number of the guns which are opposed to it at the moment. Otherwise it will be placed *hors de combat* itself. Least of all should our judgment be based on the failure of the great battery at Wagram, as here especially, nothing had been prepared beforehand for its guidance or power of manœuvring; in fact, all the conditions to success were wanting, as the battery was surrounded by the Austrian artillery.

It was just the same with the use of howitzers *en masse*. Napoleon had plenty of opportunity to understand that guns

* Undoubtedly the replacing of the civilian drivers with their hired horses (*vide* "Mobility of Field Artillery: Proceedings R.A. Institution," vol. viii., p. 287) by an organised military train in the year 1801 was a great step in advance; but the advantages arising therefrom were not properly followed up.

do not meet every eventuality, and nevertheless, in all his organisations, we find nothing prepared for the case where the *terrain* demanded the employment of howitzers on a large scale.

He paid severely for this neglect at Borodino, for it may be said that it was just this which ruined the whole of the magnificent plan which he had conceived. Should he have succeeded in taking the Bagration redoubts and the village of Semenoffskoi at the very first onset, which, on account of the very extended position of the Russians, was quite feasible, the Russian army would have been hopelessly lost. Napoleon's plan was drawn out with this object in view, and during the night, he had concentrated forty-eight twelve-pounders in two batteries of twenty-four* guns each, and the whole of the howitzers of the First, Third, and Eighth Corps, against this portion of the position, and had had cover for them thrown up. But these batteries were placed partly at too great a distance from the enemy; the chief objection, however, was the want of howitzers, as the redoubts and the Semenoffskoi valley behind them, concealed the enemy.

Each corps had only eight, and these moreover were much scattered. The consequence was, that the two divisions of Davoust, which made the first attack, met with such a reception from the Russian artillery, which was under cover, that they were placed *hors de combat* for the remainder of the day. The loss of time occasioned thereby, allowed the Russian corps on the right wing time to come up, and it was only after indescribable exertions, that Marshal Ney succeeded in obtaining possession of this part of the Russian position.

Similarly fatal to the French was the want of a mass of howitzers at the battle of Waterloo, as much in the attack upon Hougomont, as in that on the English left wing.

For the latter purpose Napoleon had placed seventy-four guns

* A third battery of twenty-four guns was established against the Rajewskoi redoubt.

(four divisional batteries of the First Corps, three twelve-pounder batteries of the First, Second, and Sixth Corps, and three horse batteries—two belonging to Milhaud's Cavalry Corps and one to Pacquinot's Cavalry Brigade) on the eminence lying midway between the position of the two armies, at about 800 or 1000 paces from the enemy. The Dutch-Belgian Brigade Bylandt, which stood on the most projecting slope of the ridge, soon disappeared under the fire of this respectable mass. Picton's English Division, which had been posted as a second line behind the crest of this ridge, was on the other hand completely sheltered from this fire. The consequence was, that they received the French attack with unimpaired forces, and, in conjunction with Ponsonby's Cavalry Brigade—which had been stationed in rear of their left flank, but which could not possibly have maintained that position had it been treated with a powerful shell fire—gave the French First Corps such a warm reception, that it was quite unfitted for any further exertions during the remainder of the day. Napoleon, as it is known, relinquished any further attacks against this wing.

Both cases (Waterloo and Borodino) show that where artillery is called upon to demoralise an enemy, it should be provided with the means to meet every eventuality which may arise from different natures of *terrain*. They also prove that, the attack of other arms (the French cavalry at Waterloo received a similar check in their attack against the English centre) is not enough to overthrow an opponent worthy of them, without a sufficient preparation by the artillery. Napoleon's maxims with regard to the employment of artillery, were at the time of the Crimean war, the prevailing ones in the French army.

We find them employed at the Alma, as well as at the Czernaja, and at the attacks upon the Karabeluaja, which latter is connected with this subject in so far that the Karabel suburb was not ready to be stormed.

This is what Pellissier did before the last attack. He opposed to the enemy's enormous artillery means, still greater ones, and when he had pushed forward his approaches quite close to the

ditch, he opened a fire from 300 heavy mortars upon the enemy's position, and a bombardment of three days' duration so demoralised the garrison, while at the same time his guns dismounted the enemy's artillery, that he could venture to enter the fortress with safety in the middle of the day. Here for the first time—consequently with equal advantages on both sides—the fight began, for the enemy commenced to issue from the cover which had been provided for him.

Other Generals.

AMONGST other armies, Bülow at Gross Beeren, Paskewitsch at Warsaw, and Haynau in some Hungarian battles (Szereck and Temeswar) were the only generals who appear to have understood how to employ artillery in this manner, or at least very nearly so. But how little have the acts of those men been understood. How very amusing must it appear to every artillerist when, in reading works on tactics, on the subject of bayonet attacks, he finds, "At Gross Beeren the Prussian infantry, without firing a shot, charged the enemy with their bayonets, and routed him on the first onslaught." We say how extremely amusing such paragraphs must appear, as it is well known that Holtzendorf had already put the enemy *hors de combat* with the fire of his sixty-four, later on eighty-two, guns, and naturally a determined advance was all that was necessary to send him to the right-about without waiting for us at all.* An attempt has been made to depreciate the merits of Prince Paskewitz with regard to his employment of the Russian artillery in the battle of Warsaw, because the effect of the considerable number of guns which were concentrated against the Wola redoubt appears to have been very small; it is quite overlooked, that here, it was not so much a question of dismounting the guns of the redoubt, which moreover was thoroughly done, as of making the hostile position quite defenceless, and to isolate

* It was only in the vicinity of Gross Beeren that there was any actual hand-to-hand fight with some Saxon battalions of the Sahr Division.

the redoubt from the reserves which had been posted farther to the rear, so that it might not become the focus of an infantry combat. The conceptions become very simple, when artillery *en masse* is employed. The chief consideration lies in this only, viz., that its powerful effect should be utilised to the utmost, and that the endeavour to accomplish the object in view, should not be made by going a roundabout way to work, and at the expense of many lives, when it could have been effected quite easily by bringing an adequate artillery force into use at the very beginning.

The battle of Temeswar, 1849, gives, like that of Ocaña, 1809, the instance on a large scale where artillery may, under certain circumstances, when attacking, not only accomplish the act of demoralisation, but also bring the battle to a decisive issue.

(*c.*) MOTIVES WHICH GOVERN THE THEORY.*

IF we have shown by the foregoing historical retrospect the capability of artillery to accomplish exclusively the principal act of the battle—the act of demoralisation—when on the offensive, and when the ground is somewhat favourable, even before it had reached the present† stage of its development, there can be no doubt that in the future it will be called upon to do so all the more.

It is only necessary to point to the great improvement which has taken place in field artillery since the wars of Napoleon I.

The movable, tactically instructed, and very efficient field artillery at the time of the Crimean war, enabled:

1. An *ad libitum* number of guns, restricted only by the amount of room available, to be united with great facility and unexpectedly against any one point of the hostile position.

2. Manœuvres to be made with the mass itself, after the original object has been accomplished, independently of the other arms.

* Vide heading, Page 48, "Theory of the Fight," etc.

† In the year 1856.

3. By increased effect of the projectiles (shrapnell, etc.), a shorter time for the act of demoralisation became necessary, and greater independence of the *terrain* was brought about.

4. By the great development of shell-fire (short howitzers) and by the addition of rockets, the artillery mass was not only able to make troops in the open the object of their fire, but also those which were under cover.

5. By the introduction of rockets, artillery was enabled to have access to ground which would otherwise have been impracticable.

The elements necessary for the above capabilities lay already dormant in the artillery of earlier times, and we have seen by what has come to light on this subject in the military history of 100 years, how the importance of artillery has increased in proportion to the knowledge of its actual capability, and its technical progress. Nevertheless, it would seem important to throw as much light as possible on this subject, or what comes to the same thing, to ventilate this question: In what does the advantage consist, which the assailant obtains from being able to carry out the act of demoralisation as much as possible by means of the artillery itself? As this must result from the nature of the arm itself, we might first go into its peculiar properties, and then consider its action with those other forces which take part in battle.

Such an abstract handling of the subject would, however, only lead us into endless dissertation without throwing a clear light on it. We shall not attempt to do this, but go at once to the core of the subject: the two principal features of all fighting, the attack and the defence, taking advantage as opportunity occurs, to consider the properties of the arm.

The defence will lead us to consider the attack.

Properties of Artillery relating to the Defence.

THE DEFENCE.—The essence of the defence consists, in waiting for the attack imposed on it by the strategical situation of the combatants, with the next object, which is, to repulse it.

The principal means which the defender possesses for this purpose is the effect which his fire will produce; and in order that he may reap as much benefit as possible therefrom, he should fortify himself with the *terrain* for the double purpose of developing his fire to the utmost—consequently obtaining thereby complete command of the ground in his immediate front—and, at the same time, of debarring the opponent from any advantageous effect which his fire might have on the defender. It also enables the latter to shelter himself therefrom as much as possible.

It follows as a natural consequence from this, that artillery will always be the main arm of the defender.

It would, however, be impossible to supply every point of attack with such a sufficient force of artillery, that it alone would be enabled to meet every eventuality that might arise. The means which artillery has at its disposal do not suffice for this. A considerable portion of it will have to be kept in reserve, in order that the enemy's intentions may be first ascertained, and then that those points which are threatened, may be supplied with a sufficient artillery force. This, however, is by no means easy.

The assailant has a great number of means for hiding his intentions. The defender, therefore, finds himself obliged to employ every means in his power to find out these intentions as early as possible; for this, the effect of his fire and the *terrain* will constitute the means, as he will occupy favourable points in the main position, or else in the front of it, with infantry; but should the ground not offer such points, it will be necessary to construct them artificially. As the assailant will be compelled to gain possession of these points first of all, the defender will have time to take the necessary steps to counteract the attack, *i.e.*, to bring up the necessary artillery force from the reserve.

Infantry fire is consequently a most powerful supplement to that of artillery, and becomes so all the more from the fact that the defence makes use of it to check the attack of the hostile artillery, and to throw every obstacle possible in the way, to prevent it from moving or taking up positions. With respect to this

latter, cavalry will be of the greatest importance, as it can attack the approaching hostile artillery when it is defenceless, viz., when on the move.

The more immediate object of the defence is certainly accomplished when the mere attack of the assailant has been met, but the final object of all warlike activity has not been satisfied, and this in the case of the defender will be the annihilation of the enemy. As we perceive, the defender fights only on the defensive, because the strategical situation obliges him to do so, but he by no means gives up his positive intention. The advance must therefore immediately follow up the fire-fighting, the repulse, in order that their results may be reaped to the utmost. And this is accomplished by means of the reserves which should be kept ready for this very purpose. Consequently, while the defender imposes the principal duty of the defence upon the artillery, when that defence merely consists in passively warding off the attack, he uses the other arms co-operating with his artillery, and with the nature of the ground, to ascertain what measures the enemy is taking to counteract them, and to gain time; and when circumstances admit, to supplement the fire-fighting as opportunity presents itself—in other words, to perform the act of demoralisation.

When on the active defence, however, he will keep his artillery ready for the main feature, viz., the advance, *i.e.*, in order to strike a decisive blow, or else it will, according to the amount of demoralisation which the fire-fighting may have brought about in the enemy's forces, assist in annihilating them. We have already seen that the active defence offers the most favourable combination of fire and assault.

The predominating attributes which fit artillery so pre-eminently for the defence are its great capability for warding off an attack (its effect at long range, power of demoralisation, command over the most different varieties of ground) and the tenacity with which it can remain effective under hostile fire, in spite of great loss.

Properties of Artillery relating to the Attack.

THE defender while waiting for the attack may make his dispositions such, that he can more or less of his own free will, himself assume the offensive on the enemy's approach. The warding off of the attack, will therefore not depend so much on the advantage which a favourable ground, and the consequent power of sweeping it with his fire, may confer on the defender, as in a forward movement, and on the use which is made of the advantage which may ensue from its effects.

The defence is therefore in this case in the most favourable condition for taking the offensive, as it would occur when the enemy is unprepared with dispositions to meet it, favoured by the ground, and probably also when the position is strategically advantageous. But it is only a high intellect, and great power of instantly coming to a right determination on the part of the commander, that will enable this to be carried out with success. With the present organisation and armament, this form of attack can only reap great results, when the enemy's first local stand is rapidly overcome by the fire of a mass of artillery. The "shock" should never degenerate into a languishing fire of skirmishers, but the shock-power of the cavalry may be advantageously employed in the event of the enemy's being surprised into momentary defencelessness, or should hostile cavalry endeavour to oppose it.

The fact of the defender being able to make his dispositions for the attack beforehand, and to place his forces so as to take every advantage which the ground presents, will generally enable him to place himself in a most favourable strategical position relative to the hostile situation. From this great advantages are sure to arise. Moreover, he will, by being able to bring a superior numerical force to bear upon the deciding point, be enabled to effect a surprise and to circumvent the opponent, both of which eventualities are important factors in obtaining the victory, and are completely at his command.

The artillery mass, *i.e.*, the concentration of artillery forces, is the fittest instrument for giving effect to the above principal means for ensuring victory.

THE SURPRISE.—Infantry and cavalry may, under the shelter of night or when concealed by the ground, by suddenly appearing completely disconcert the opponent, and without any support, simply by the effect of their fire, reap the fullest results from this momentary defencelessness of the enemy. But when everything connected with the circumstances of the fight is completely developed, the most advantageous results from the effects of the assailant's fire cannot be realised. Sudden superiority of fire will be the only way of surprising, and of depriving the defender from establishing his order of battle.

A sufficient force of artillery can always be brought together by the defender to oppose a mass of infantry advancing under the above conditions; the ground and the fire of the infantry will be sufficient protection against a cavalry attack. There is, however, no means of escape from a mass of artillery making its appearance unexpectedly,* leaving flank movements by artillery out of consideration, provided that it approaches within effective range.

We have here to do with an especial peculiarity of the artillery fight. The sudden superiority in fire which artillery can command, is consequently not only of value because it suddenly overwhelms the momentary situation of the fight, but also continues to maintain this superiority against the reserves which the enemy can bring up, unless these are in their turn not too superior and arrive simultaneously. What decides the artillery combat in contradistinction to the infantry fire-fight, is the superiority in the number of guns actually employed at the same time, the calibres, as well as other attendant circumstances, being similar.

Let us consider infantry fighting to their front, where one portion in the first line consists of skirmishers only, forming a rank with many intervals, whilst the remainder, however, remain be-

* "Celui qui sait faire arriver subitement, et a l'insu de l'ennemi sur un des points, une masse d'artillerie, est sur de l'importer."—*Napoleon.*

hind under cover; there is no doubt of the decided superiority which it possesses over the other side which is of equal strength and has similar extension of front, but keeps the whole of his force delivering its fire in a serried line.

It is quite different in an artillery fight.

Should one side keep back part of its guns, those which are in action in front would soon be disabled, and those coming up to reinforce the first line of fire would be demolished in detail. Should they be employed in this way, the defender's artillery reserves coming up one after another would find themselves opposed to the powerful line of the assailant's guns, which has been some time in action, and has meantime overcome the weak force of artillery which was originally opposed to it. The reserves will be already suffering loss during their forward movement, and at the instant of unlimbering they present a large target to the enemy's guns. They will therefore, unless they possess great superiority, which must come into action simultaneously, succumb in succession.

We must, however, state as a proviso that the assailant has this superiority. In the artillery fight, therefore, it is the simultaneous employment of force, in the infantry fight, the successive employment which decides. Military history gives numerous instances of this, the most striking are the battles of Borodino and Leipsig (Probstheide).

The reason consists in this, viz.: that the serried infantry line cannot take the individual skirmisher as a target, the line suffers greater loss, as there are no intervals, and thus becomes expended from the very beginning, whilst the other side suffers much less loss, can take advantage of cover, and keeps a large part of its force fresh. In the artillery fight, however, each gun takes an opposite one for its immediate object to fire at, consequently several of the assailant's guns would be concentrated upon one of the defenders; the intervals when not less than twenty paces make no difference, as they are the same on each side, and the force coming up presents a large target.

The defender will certainly have the cover for those guns which have been originally placed in position, and the means of providing beforehand that the guns of the reserve coming up shall not be placed exactly opposite, but obliquely to the enemy's guns, and can use them for flanking purposes. This latter is, however, owing to the great distance at which artillery fighting is carried on, difficult, and involves great loss of time, can be hindered by counter movements on the part of the assailant, and by his choice of the attacking point; the first, *i.e.*, the cover, may be to a certain extent rendered nugatory by shell and shrapnel fire.

THE ENCOMPASSING (*umfassung*).—This is, in a double sense, most important in tactics; firstly, as it enables the enemy's line of retreat to be threatened, for it can be closed by means of this manœuvre; and secondly, on account of the more advantageous employment of the defender's forces, both in fire-fighting and in the *mêlée*. We are interested here in the fire-fighting, which serves as a presupposition to the two others.

Intelligible as the subject appears to be in itself, it may not be out of place to clear up many an erroneous idea which exists on this point, more especially as this subject is of the greatest importance in tactics.

We have just seen that in the "frontal fight," where both sides stand parallel to one another with a similar extension of front, which we may consider as part of a great whole—without which the consideration would be but of little value—in the case of infantry, it is the employment of its force in succession, in the case of artillery, it is the simultaneous action which decides. The assailant therefore, will only reap the benefit of the superiority in numbers which he may be able to direct upon such a frontal point, by surprising it, and this, indeed, must be done by an artillery force, for otherwise the defender has time to bring up an equal force simultaneously, and the infantry fire-fighting —owing to the loss of time which that nature of fighting entails, viz., a succession of combats, and which alone would make its

superiority apparent—gives both time, and with it increase of strength to the defender. With the "encompassing" this is quite different. Here it is the simultaneous development of the assailant's forces which decides in the case of the infantry fight, and even more so in the case of the artillery combat.

Let us imagine two lines of skirmishers standing opposite to one another on concentric arcs, there will be more room for skirmishers on the outer arc than on the inner (supposing the intervals between the skirmishers to be the same, when the probability of their being hit would be about equal), and it will be all the more, the greater the distance between the arcs; consequently with the improved arm, where this distance is about 400 paces, much farther than with the old one, where it was about 100 paces. Consequently many more men will fall, or at least be hit, in the inner arc than in the outer. Should the inner arc, supposing the forces on each side to be equal, wish to condense its fighting line by bringing up some of its spare force, its losses will be all the greater as the intervals will then be smaller. It is pre-supposed that the lines of skirmishers are pretty thick. Should it keep this superfluity back, in order to utilise it to fill up casualities, it suffers from this other disadvantage, viz., that the skirmisher on the outside arc has got his range exactly, while the new comer of the inner arc has to find it out, and he will be, moreover, upset by the loss which his own side has met with.

This advantage of the skirmisher on the outer arc is still more increased from the fact that he flanks some portion of the inner arc, and he can therefore pour in an enfilade fire; and besides this, bullets missing the first line are more liable to take effect on the supports standing behind them, than would be the case when the circumstances are reversed, as the supports to the larger arc will not be so concentrated.

The above are the conditions which constitute the only means by which the assailant, in the case of an infantry fight, can profit, when he wishes to avail himself of his numerical

superiority to bring about a rapid decision, and even in this case, the defender will have the advantage of cover to set against it.

"Encompassing" in the case of the artillery combat is, however, of much higher importance, as the distance between the arcs being much greater, the exterior one will contain a much larger force than the interior one, the great striking power of the shells is increased, the advantage of outflanking is developed to a greater extent, the advantage which cover may afford is considerably lessened, and the other troops standing behind the defender's guns are wedged in to a greater extent, consequently every shell tells.

The artillery mass therefore will be turned to the most profitable use when used to "encompass," and it is the fittest instrument for developing to the utmost the advantage which encompassing confers.

The impossibility for the encompassed part to oppose equal forces to the encompasser renders the attack upon him favourable under every circumstance. Should the defender possess a sufficient force of artillery, an attack upon his centre would not be permissible, as this force would on its side encompass the assailant.

We thus see that "surprising" and "encompassing" make it feasible to the assailant to employ his numerical superiority to the utmost advantage, which is in tactics the most important principle towards gaining the victory, and may be expressed by this maxim—"Massing upon the deciding point." We found, however, that massing infantry and cavalry was not in itself sufficient, as it gives the defender time to bring up fresh forces from his reserves. But when combined with artillery masses, they then for the first time become masses. They must therefore not be simply inert masses, but "concentrated fire masses" upon the deciding point, and a force in rear, ready to follow up the fire and deliver a vigorous onslaught. This leads us immediately to another important peculiarity of the artillery combat,

which renders the artillery mass a most important instrument in the hands of the assailant. This is the comparatively short duration of the act of demoralisation. We already know that in the infantry fight it is only by a succession of efforts that numerical superiority can be made to act advantageously, but upon a numerous artillery, such as the defender can bring up and direct against it, it will never make any impression, for the infantry would in fact be shot down before it could become efficacious. The successive employment of the assailant's forces gives time to the defender, and he has, in consequence, a greater chance of gaining the superiority. The immeasurably greater power of demoralisation which artillery possesses, and the advantage which a simultaneous exertion of its whole power confers on it, makes itself potent in the attack by shortening the act of demoralisation, and, consequently, by gaining time. It makes itself also potent to a still greater extent by its moral effect, which, by means of this shortening of time, is called forth in the opponent. Both of these are very important factors, to which a third may be added, the effect of spent shot* and the effect upon the reserves, which under favourable circumstances may actually go so far as to deter the reserves from supporting the front line (battle of Warsaw). The defender has the especial advantage of the *terrain* to compensate him for this. The *terrain* must afford him the means, as we have seen, for, firstly, protecting himself, then for discovering the enemy's intentions in good time; it should enable him to gain time, it should be a means of weakening the assailant and depriving him of any advantages in the way of shelter, etc., which he might find in the *terrain*. The *terrain* can do this, and it presents situations most favourable for infantry combat, such as villages, copses, hedges, defiles, etc. It is here that the defender will reap the greatest advantage, from the most improved infantry firearm.

But it is exactly in this direction, viz., in overcoming these conditions, that the progress which field-artillery has made lies.

* This is no longer the case with rifled guns.

The efforts which have been made to obtain this progress, have been directed towards making it independent of the *terrain*, in the double sense of effect and mobility. There is at present no *terrain* where artillery (shrapnel improved shells) could not act with effect, and there are few points which it cannot reach with its missiles (rockets). As by this means it makes the protection which the ground affords to the defender illusory, it also, by the facility with which it can approach its object, both closely and rapidly, deprives him of the advantage of obliging the other arms of the assailant to approach without shelter. The importance of these two last points, viz., being superior to any difficulties which the ground may present, and the power which its increased mobility confers on it, of protecting its own forces, requires to be explained.

The *terrain* protects the defender who is stationary, the artillery protects the assailant who is on the move, and is obliged to appear in the open, by compelling the defender's guns either to be silent, or else by drawing their fire upon itself.

The artillery, by the energetic effect of its fire, and by the superiority which the assailant, by concentrating his forces upon the point of assault, confers on himself, is particularly fitted for this, and the defender's artillery cannot withdraw itself therefrom, for, in order to act, it must expose itself more or less, and presents a decided object to aim at, which cannot well be missed. But we are not quite satisfied even with this explanation. The assailant's artillery must also endeavour to take care that the protection which it affords to the other arms will have the effect of bringing them as near as possible to the enemy's position, otherwise the advancing troops would only mask their own artillery, and the hostile reserve artillery, which would be now coming up, would have an opportunity of again making the issue doubtful.

The assailant's artillery must therefore, after by dismounting the enemy's guns, etc., it has cleared the road for the movement

of itself and the other arms, manœuvre as near as possible to the enemy.*

A great part of the superiority which artillery of the present day possesses over that of former times, consists, next to its power of surprising, in its greater mobility and capability of manœuvring. In this also lie the limits which must be set to the increase of effect at the expense of mobility, with regard to the question of construction, the nature of the ordnance being also considered, in respect to the supply of reserve ammunition.

We require a sufficiently effective and movable, consequently a comparatively heavy artillery to overthrow the enemy, and a light artillery capable of rapid manœuvring, and well supplied with ammunition, "divisional artillery," in order to hinder the enemy from again forming.

This is however, not to exclude the light artillery from acting beforehand in the general mass. Should the *terrain* be completely unfit for moving over it, then we require rockets, in order to replace as far as possible the more effective ordnance which has been obliged to be dispensed with; which, at all events, when we consider the present effectiveness of rockets, would practically do so to a very small extent. The present field artillery has endeavoured to obtain a mastery over the advantages which the *terrain* has conferred on the defender, by an increase in its effects, by the greater variety and accuracy in the trajectory of the projectiles (shells), and in their effects (shrapnel).

Artillery alone is enabled to overcome the obstacles in the approach to the enemy's position (defiles, weak walls, abbatis, redoubts, dismounting the enemy's guns which are behind cover) in a satisfactory manner. It alone is able to render an enemy behind cover inoffensive; and in all these respects its importance for attack has, owing to the introduction of the improved infantry firearm, increased. We have already remarked that the advantages of the new arm tell most in favour of the

* With rifled guns this will not be necessary to so great a degree.

defence; and should the assailant wish to make use of the same arm the result would be unfavourable to him. For this purpose the assailant requires artillery; should he wish to employ the infantry firearm to advantage, he must assume the defensive himself.

Against an enemy behind cover howitzers should be massed. Seventy shells bursting in one place, and two minutes after seventy more in the same place, will shatter the best infantry.* And this can be done at a quite disproportional sacrifice, and with a small loss of time. The shock can follow up this effect immediately, because the howitzers need not discontinue their fire during the advance of the infantry. The howitzer mass must not content itself with shelling the position itself, but should also endeavour to reach the reserves which are directly behind it. One must not urge that because the enemy cannot be seen, some idea of the effect produced cannot be obtained. Whoever has an eye tactically trained, will soon find that out.

Moreover, there is another way of obtaining this information. The instructions of Frederick the Great of the year 1768 with regard to the employment of howitzers contain the following: "When the batteries come into action artillery officers must be sent sidewards, in order to ascertain accurately if the shots produce the right effect, and fall upon that spot which is to be attacked, and be enabled consequently to regulate their fire accordingly." The properties which are peculiar to artillery are consequently of the greatest importance, and can be replaced by no other arm, by no other exertion of power; and even where they are replaced this can only be done at great sacrifice, and at a great expense of time. It will therefore amount to a crime, and will anyhow be a great fault, wherever this is done without urgent necessity.

* The instructions of Frederick William III. of the 10th August, 1813, say in this respect, "Should the enemy be on the reverse side of heights or otherwise protected, it will be advantageous to unite the howitzers, as a large number of shells thrown upon one spot produce a fearful effect, which for the most part it would be impossible to withstand."

(*d.*) OTHER PECULIARITIES OF THE ARTILLERY COMBAT.

THE progress made by artillery is, as we have seen, almost entirely in favour of the attack;* indeed, it requires both the peculiarities of the arm alluded to in the defence, viz., the great power of repelling an attack, and the *tenacity* in which artillery excels the other arms. For the attack must, when following up its first advantages, and as long as the whole army is not giving way, move forward in complete order of battle; and after having wrenched certain advantages from the enemy, it must give itself a temporary rest, in order to collect itself for further efforts. In doing so, it will be protected against any eventual onslaught of the enemy by its artillery. The importance of the repelling power of artillery is further increased by this; viz., that supposing an attack of its own troops has miscarried, and that they have to retire to obtain protection and gain time to reform, they can do so safely under its cover, and gain fresh courage for a new assault.

The advancing army must also keep itself secured on other points against an offensive blow on the part of the enemy, and for this purpose the repelling power of artillery will constitute the simplest means. The army will require for this, besides the attacking mass, a movable reserve artillery.

Whether it be masses of guns, howitzers, or rocket batteries, which are to complete the act of demoralisation, they must be able to do so quite unfettered, and not in common, or employed by, but protected by the other arms. If it becomes a question of bothering oneself about every foot of *terrain*, and reason has to be given to the superior officers of the other arms for every single movement, then there is an end to freedom of action and to independence. The arms must move according to the part they have to take in deciding the battle. The commander of the artillery mass should be of just as high a rank as the office

* The defence has materially gained by the introduction of rifled guns.

commanding the infantry or cavalry division. He receives equally with them from the commander-in-chief, the explanatory instructions connected with the dispositions for the battle. It is only by this means that the artillery mass becomes valuable as a tactical instrument. The object which it has to attain must be comprehended from the beginning, and must not be left to chance. This operates most advantageously back upon the chief command. Everything becomes simpler, the fighting object is more determined, the carrying out of the fight is more certain, because more unity of will pervades it.

The tendency of artillery fire is to concentrate itself, and consequently it is advantageous that there should be one commander, one directing "will." The tendency of infantry fire is to disperse itself, and consequently the one "will" will be split up. And it is so true, that we find it confirmed everywhere in history. Where there was a determined will on the part of the highest in command, the act of demoralisation was performed by the artillery; was the will weak or vacillating, then the fire of skirmishers predominated. The nature of these arms points to this.

The infantry soldier in the ranks who fires at the word of command, cannot take aim. Each individual man discovers the inconvenience of this, everything urges for a dispersion.

Besides, the line or the column presents a much larger object for the enemy's fire, than the skirmisher fighting singly.

This disagreeable state of affairs attains its maximum, when skirmishers are opposed to troops in close formation.

The helplessness of the gunner is self-evident, he swears by his gun. The No. 1 alone with his gun is helpless, he must have something to back him up. The first means of obviating this helplessness consists in the battery of six guns, which has in itself the means of defence against assault on various sides. When the fighting conditions are on a larger scale, then the artillery mass will alone satisfy these conditions, as it then becomes independent. The same may be said of cavalry.

Therefore, when circumstances allow (and with the assailant this will be the case), to the artillery should be assigned the act of demoralisation; to the cavalry, the annihilation of the enemy; the infantry will be the arm to decide the action. The co-operation of the different arms should not, however, be lost thereby; it is only united into one great whole, individually, and in order to carry out the immediate object before it. The infantry, as well as the cavalry, requires the assistance of the artillery which is organically connected with it (divisional batteries), and the artillery mass requires the protection of both.

The carrying out of the fight becomes more certain by the mutual co-operation of the different arms. The long-continued fight of the skirmishers, with the assistance of blow and counter-blow, is so much of a hand-to-hand fight, is so difficult to control, there is so much scope given for the play of the various idiosyncrasies of the human mind, the will is so dispersed, the development of intelligence in the minds of the lower ranks is so small, that the working together in order to attain a common object becomes almost an impossibility. The mutual co-operation of the different arms, on the other hand, gives power; it makes them first of all an instrument to be depended on; discipline here for the first time exercises its full power. The artillery mass can, when once it is in position, sustain great losses without being morally shaken, and without a material relaxation of its fire-power.

Should some of the guns become dismounted, then the remainder must increase their fire until the former are replaced; should men and horses fall, the remainder are not to take to flight, they are to go on firing until reserves in men and horses turn up. The gunner is chained fast to his gun. The moral impression which the artillery mass exercises, as it has a most shaking effect on the nerves, will result in its experiencing, comparatively speaking, small loss from the enemy's skirmishers. When the shells are whistling over their heads, with their arms

shaking, their knees knocking against each other, the finger trembling, there is no longer any question as to aiming. The most efficacious effect upon artillery will always be made from the flank. The guns which are on the flanks do not consider themselves as threatened.

The artillery flanks must be therefore diminished as much as possible, *i.e.*, one must fight *en masse.*

Besides, the artillery mass need not approach so near as scattered batteries, which are to support and strengthen a continuous, long skirmish-fight.

However curious it may sound, it is really the case, that in skirmish-fighting it is the artillery which gives the impulse both for advancing and retreating. This constitutes part of the moral effects which it exercises. The batteries, therefore, are obliged to hold out. But with the infantry firearm of the present day, the result would simply be ruin to the arm. The protection of the batteries demands besides a considerable force which can be employed for no other purpose. On the other hand, when in mass, artillery will partly protect itself, and it will be partly protected by the troops which are prepared to deliver the shock, who will lose nothing of their strength thereby.

Another and very material advantage may be added to all those which the employment of artillery *en masse* presents, and which fits it for an independent purpose, viz., the carrying out of the act of demoralisation on the part of the attack, and is one which we have already alluded to. It is the saving of men.

If the question as to whether such and such sacrifices are to be made or not, cannot be taken into consideration for one moment when necessity calls for it, when great results have to be obtained in a war where the existence of nations is at stake, at the same time, the consideration as to whether the same object may not be attained at a far smaller sacrifice of men, and even with greater ease, should not be cast aside.

Moreover, it is not simply a question of men, but of trained and disciplined soldiers, whom it is difficult to replace,

It was not the increasing weakness of *morale* on the part of the infantry which drove Frederick the Great and Napoleon to increase their artillery, for the Prussian grenadiers at Torgau and the French at Eylau and Friedland, were in no way inferior to those of bygone years. Much rather was it the conviction that it would be monstrous and quite useless to sacrifice them, where the object might be attained in a simpler manner. It was, therefore, the knowledge of the destructive effect of the enemy's artillery on their own troops, and the other results which can be obtained with artillery, which induced both these generals to increase this arm, and to use it so predominantly.

The artillery mass which produces much greater results than the infantry fire, necessitates much fewer men being brought into action, consequently there are far fewer men exposed than with the other arms. The fight lasts a much shorter time. The blow given by the other arms which follows the artillery fight, passes off without any hand-to-hand fighting, and in the act of annihilation, owing to the predominating influence which the one side exercises upon the other, which is therefore not reciprocal, the pursuer will suffer very slight loss, the pursued will have few killed, but many taken prisoners.

But it may certainly be said that the losses of the artillery will be out of all proportion.

This, however, will be sensible, chiefly only as regards officers and horses; for, owing to the development of industry and means of transport of the present day, *matériel* can easily be procured, and those gunners that have been placed *hors de combat*, may be replaced by infantry and cavalry substitutes, who are already disciplined and hardy soldiers. It is more difficult to replace experienced officers, but a sufficient number must be formed in peace time, in order that no want of them may be felt in war time.

Besides, the loss in infantry officers will be much less than with the present method of fighting.

A sufficient reserve of horses must accompany the artillery.

The chief point, viz., that the actual number of soldiers placed *hors de combat*—for it is in them that the strength of the army consists—is less, will however always be established. This is to be attained by the predominating use of artillery.

While we now proceed, after the explanations with regard to the artillery combat, to those wars which were carried on with rifled guns, we must remark most explicitly that not only tactical literature, but those authors who belong to the arm itself, were involved in theories which were most completely opposed to those fundamental principles which had been solved.

Allying themselves to the tacticians, with them it was the rule to keep the artillery mass (reserve artillery) ready for the deciding moment, but to carry out the act of demoralisation with the infantry, together with the artillery (divisional), which was organically attached to it. The artillery mass was, however, considered to be suited in a very conditionary manner for this purpose, and only when the object to be fired at was clearly in front of it, and the *terrain* was quite open; moreover, only the lighter (because more movable) natures were to be used, and it was only in great battles that they were to play this rôle especially. It will be the object of the succeeding sections to show the eventual transition to sounder principles.

PART II.

THE PERIOD SUBSEQUENT TO THE INTRODUCTION OF RIFLED ORDNANCE.

1. *CONSIDERATIONS OF THE TACTICS OF THE WARS FROM 1859 TO 1866.*

THE changes which tactics have undergone since the introduction of rifled firearms, are by no means to be attributed exclusively to the latter, but are materially due to the clearing up of those opinions which an extensive war experience has enabled us to oppose to the theories of a long period of peace. These peace theories, and the peace practices ensuing therefrom, had placed themselves in opposition to that which military history, which means the reproduction of the "practice" of war, had shown as being the right ones, and sanguinary experiences were required in order that they might be again turned into the right channel. The experiences, and the manner in which they were profited by, were interpreted by each of the armies which have carried on war in a manner peculiar to themselves, and lend an especial interest thereby to the latest campaigns.

It may be taken for granted as a general fact that rifled firearms chiefly produced an influential effect according to the manner in which they were used by the various arms, infantry, cavalry, and artillery, but that the general laws of tactics, in the combinations of the different arms, as they had already hitherto stood, were on the other hand very slightly affected.

The principal thing that has become necessary, is that the

greatest care should be used in taking advantage of the *terrain*. The expression "New weapons, old tactics," is therefore in the main applicable to the Corps Commander, even after the experience of the campaign of 1870; on the other hand, it would be quite erroneous for the company-commander to make use of it.

A summary of the tactical results of the campaigns of 1859—1870 will show the eventual return from the peace views to the method of fighting employed by Napoleon I., and the modifications which had been introduced into the manner of using the individual arms. It is evident, however, that this can only be done quite approximately. In doing this, we shall especially have to remark on the relation between fire and shock, and the influence which artillery exercises with respect to the former. A marked increase in its influence will reveal itself, at the same time the importance of manœuvring will assert itself.

Campaign of 1859 *in Italy.*

WE have already pointed out the inefficacy of the shock without sufficient preparation by the artillery on the part of the Russians in the Crimean war, and the advantageous use which the allies made of the same. But the infantry of the allies also made use almost exclusively of fire-fighting, which was perfectly justified by the very indifferent way in which it had been developed in the Russian service, and by their bad armament.

This circumstance, however, was quite different in the campaign of 1859 in Italy, where the Austrians had a decidedly better weapon (Lorenz pattern, muzzle-loader) than the French. The Emperor Napoleon, who cannot be said to have been devoid of military sharpness, therefore enjoined his infantry to rush forward with the bayonet, and gave his artillery rifled guns.

The shock then again assumed its rights, but only in the sense of profiting to the full by the results of the fire-fighting, for in fact we may search in vain for real attacks with the bayonet.

The French advanced, taking most careful advantage of the protection which the ground afforded, sufficiently near to make the disadvantage of their inferior weapon as little apparent as possible, endeavoured to compensate for the inferiority of their arms by numerous swarms of skirmishers, and then hurled themselves with comparatively detached columns upon the enemy, who was little prepared for this method of fighting, and who exhausted his strength by stationary fire-fighting.

The sheltered *terrain* favoured this method of fighting uncommonly, and where on the open ground their impetuosity recoiled before the enemy's fire, artillery was brought up, in order by means of it to break down this fire. In this respect the battle of Solferino is of great interest. It was by this method of fighting that Marshal Niel, in the protected *terrain* of Robecco, was enabled to make any advance against the considerable superiority of the Austrians. When the infantry fire-fighting began to waver, he brought a mass of battalions from his reserve, and "the bayonet," as he expresses himself in his report, "recovered everything that had been lost by the fire-fighting."

If this phrase may have been written more for the Emperor, who had called attention so strongly to the bayonet, the whole course of the fight shows the continual *en avant* the close connection between fire and shock, which must predominate in an infantry fight, but above everything the "initiative," which seems to have been an especial feature of the French generals. With the Austrians however, the total absence of this initiative was the principal cause of Niel's success. They fought in the campaign of 1859 quite in accordance with the rules of the methodical fight, as recommended in the German literature, where the firing and the "nourishing" of the fight by firing absorbed the best forces, without combining any other object with it than the eventual weakening and using up the enemy's forces, until the moment had arrived to bring about a decision by the last fresh reserve, *i.e.*, to assume the offensive and deliver the blow. But this moment never arrives, because the "nourish-

ing" the fight causes new brigades to be brought up from the reserves, and the latter consequently dwindled so, that in spite of all the original superiority, nothing remained at the end to deliver the decisive blow with.

While this was working itself out on the Austrian left wing, which had positive orders to attack, the nearest reserve, the First Corps, was employed in the centre, which had orders to remain on the defensive, in order to relieve the Fifth Corps, which was in the first line, instead of taking the offensive with it, and the main reserve of the Second Army, the Seventh Corps, was used to take up a position which could be surrounded on all sides. We have called attention to the defects of the methodical fight, as they here appear, to the want of initiative, which resulted in the useless nourishing the fight, to the squandering of the reserves in sacrificing them by brigades, finally to the danger which ensues from using the last reserve which is still intact for taking up a position, instead of leading it forward to bring about the decision. But what happened at Solferino serves as an indication of what happened in every fight of this campaign. Even Benedek, who understood how to repel the successive attacks of the Sardinians (who were superior to him in numbers) against the right wing, was deprived of the services of nearly one-fourth of his force, amongst which was the Brigade Waterfliet, which performed the functions of a force occupying a position rather than those of a reserve.

The battle of Solferino commenced as a "*rencontre* fight," with an engagement along the whole front. Consequently on neither side was there any design of the battle. Had the Austrian generals possessed the slightest spark of initiative, *i.e.*, the gift of quick perception and determination in acting, then the First Army (Wimpfen) on the first cannon shot, ought to have at once advanced and made an attack, as the instructions which had arrived from headquarters before the Mincia had been crossed, were in favour of doing this. The advanced position of Solferino, which was the first object attacked by the French, and the

support of their own advanced posts moreover, made this imperatively necessary. Instead of doing so, they waited for orders, and allowed the French to take possession of the Campo di Medole, the west end of which was immediately armed with batteries, and every attempt of the Austrians to bring their batteries against it was nipped in the bud. Besides the batteries of McMahon's division, and those of the two cavalry divisions (altogether six batteries), there were all the seven batteries of the Fourth Corps (Niel's) placed more towards the south, facing Casa Nuova, which were probably later on strengthened by batteries of the Third Corps (Canrobert's). Apart from the fact that the French had rifled guns (and consequently a great advantage in their artillery over the Austrians), the re-establishment of an equilibrium was now no longer possible. Anticipation in placing their guns in position accounts therefor. But the Austrians had not even room to develop a superior number of guns, to do which would have been more essential than anything else.

These are the circumstances to which the general non-employment of the principal artillery reserve of the Austrians may be attributed. This great battery of more than eighty guns is most interesting, not only on account of the confirmation which the laws of the artillery combat here receive, but especially by the importance which this circumstance had on the issue of the battle. Niel was indebted to it for the greater part of his success against Wimpfen, for his left flank was placed in perfect security, and the battery co-operated with it most decisively in the fights at Casa Nuova.

Further, the great battery made every advance of the Austrians upon the great road towards Castiglione (to do which at last an order came about twelve o'clock) quite impossible, and would have increased the difficulty of an advance in the covered *terrain* to the north. A superior cavalry force would alone have obliged the French batteries to keep at a distance. The circumstance that the French from the very beginning, made Solferino the object of their attack, and directed their reserves (the *corps de*

garde) to advance upon it, had a most deciding influence on the result.

It was the force of circumstances rather than any original plan which made the battle on the French side assume the phase of a "manœuvre fight," as their extreme wing led the Austrian forces to deviate eccentrically, thereby isolating their centre and leaving it exposed to be attacked by superior forces. If, nevertheless, the fighting here was very stubborn, it was due to the successive employment of their forces by the French, who only at the latest moment endeavoured to encompass their opponent, and notably on account of the sparing use they made of their artillery, which was not brought up until the French infantry, which had rushed impetuously forward, without a preparatory artillery fire, had been beaten back. The artillery then certainly did its duty, and showed its complete superiority over that of the Austrians. Its results, owing to the great range of the rifled guns, was quite surprising during the pursuit.

The skilful leading of Niel is to be thanked, for the fact that the Second Corps (McMahon's) was enabled to take part in the fight of the centre, as he drew the superior forces of the Austrians upon himself.

The French had, since the Liberation wars of 1813-14-15, occupied themselves but little with the science of tactics, and, luckily for them, had paid little attention to the German literature on this subject. The war in Algiers had nothing to do with the manner of conducting battles according to the tactics of Napoleon, but it had created practical commanders, who knew how to accommodate themselves to circumstances, how to exert influence on their men, and had acquired the faculty of forming a rapid conception and determination in acting. At the same time they found in the common soldier, and in the lower ranks, on account of their inborn soldierly proclivities, admirable support. The tactics which they developed in the campaign of 1859 were neither entangled in theories, nor were they cleared up by definite maxims; it was simply the natural emanation of

their military skill which had been greatly increased by experience.

Moreover, after the war, they did not consider it at all incumbent on themselves to reflect on the causes of their successes, much less to fathom the faults which they had committed. It was different with the Germans. The Austrians, who formed the first line, took home with them from the campaign this information, that the employment of artillery *en masse*, when it is to take general part in the action, must be made from the very beginning, and the infantry attack must really be the one to bring about the decision. Therefore why not commence with it also? as the French apparently did, and the proclamation of Genoa ordered. When both were combined together, and directed upon the right spot, this method of fighting possessed this advantage, that it favoured the employment of manœuvre; but the fire-fighting of the infantry, the development of a swarm of skirmishers, had been rejected with disdain, even where insufficient artillery, or none at all, was on the spot.

This latter very frequently occurred, so that, owing to the predilection for fighting the artillery *en masse*, too little consideration was given to providing those brigades which were not combined in divisions, with artillery.

The Austrians thus appear to have taken up the tactics of the Russians in the Crimean war, which consisted in delivering blows without taking any consideration of the fact that the French had met them with diametrically opposite tactics, viz., by opposing them with fire-fighting. Even the bloody experiences of Konigshügel and Oversee in the Sleswig-Holstein war of 1864 did not turn them therefrom, but rather appear to have strengthened them therein. They went so exclusively into this adopted system, that the training of the infantry soldier in musketry was neglected, and they appear to have no longer even been aware of the methodical fight, by means of which the enemy was to be arrested and occupied. The idea of taking advantage of the *terrain*, seems also to have been scorned.

The work on the campaign of 1866, by the Austrian staff, part 1, page 64, contains the following: "The conviction, that the plan of fighting more on the defensive, which had been handed down from previous years, seldom led to favourable results—had become completely established in the Austrian army since the campaign of 1859, and had led to this becoming an axiom in the manner of fighting, viz., that in the fight, the attack was to be made as rapidly as possible, and the opponent anticipated and outbid in this respect."

Campaign of 1866 *in Italy.*

FROM this spirit of the "offensive" arose at once that which had been neglected beyond measure amongst the Austrians, viz., initiative on the part of the commanders. If in the campaign of 1866 this was occasionally exercised in the wrong place, or in a manner not justifiable from a military point of view, as was the case with the Brigade Fragnern in the battle of Skalitz, and with the Second and Fourth Corps in the battle of Königgrätz, it was evinced quite in a contrary manner, and in the most surprising way at the battle of Custozza, and it was universal to an extent, which the whole past of the Austrian army can give no example of in any second battle. The advance upon the left flank of the Italians with the object of attacking them after they had crossed the Mincio, produced such tension, and such determined energy in the army down to the common soldier, that in the many partial combats which resulted from this attack, individual commanders showed the highest determination and spontaneity.

On the other hand, the Italian generals appear to have entirely lost all power of taking the initiative. It would appear that being thrown on the defensive, all their powers were paralysed. The surprise of the Italians was complete on all points, but full advantage thereof could only be taken on the two flanks.

The great superiority of the Italians, as at least originally surmised on the Austrian side, nevertheless demanded some caution. The left wing (Seventh and Ninth Austrian Corps) was obliged to

be kept back in order to secure their own communications in the Staffalo valley, and by Somma Campagna. The right wing, the infantry reserve division, and the Fifth Corps, received on the contrary, orders to assume a most energetic offensive. Here the enemy's line of operations and the passage of the Mincio, were the main objects. The battle on this account, as well as by the whole idea on which it was planned, assumes the character of the manœuvre fight.

The situation, on coming into collision with the opponent, was such a favourable one for the Austrians, that the left wing of the Italians was enabled to be attacked on its flank, and overthrown. All arms co-operated to bring about this result. The greatest part of the reserve artillery of the Fifth Corps was immediately brought into action. It was only to the want of unanimity in the guidance on the Austrian right wing, that the hitches which occurred in the course of the battle at a later period, can be ascribed. The commander of the Fifth Corps should have been given command of the reserve division, and of the detachment from Peschiera.

The order for the reserve division to destroy the bridge of Monzambano produced a most pernicious result.

The circumstances were similar to those of the Prussians in the fighting situations of Trautenau and Schweinschädel.

The enemy was posted on the flank of the direction which had to be taken, and it was first of all necessary that he should be dislodged therefrom. It was only at Schweinschädel that the situation was properly grasped. It was necessary to drive the enemy from the heights of Monte Vento and Pasquale, before Monzambano could be reached. The attempt to advance against Monzambano in spite of this, and without taking the above step, resulted in the defeat of the troops who were told off to this duty.

With regard to the employment of rifled guns, this important knowledge was gained here, viz., that it is none the less incumbent on them to approach the enemy. The Austrian batteries had taken up their first position at a distance of 4000 paces from

the enemy. A considerable time elapsed before it was decided to bring them nearer to Monte Vento. The result was then quite astounding. The advance of the artillery reserve of the Fifth Corps to Bassetta, immediately facing the enemy, at a distance of 1400 paces from him, renovated the drooping energies of the infantry. Three batteries were also united to the Brigade Möring of the Fifth Corps on its advancing to the attack, so that hardly any resistance was made to the infantry onslaught.

Unanimity of command was equally wanting on the Austrian left wing. Here the Seventh and Ninth Austrian Corps were fighting. If the conditions had been more accurately looked into at an earlier period, there would have been no difficulty when surprising the Italians, in pushing the Austrian left wing right up to Custozza, and to barring their line of defence here. The Italian Division Brignone on the Monte Croce, was so little prepared to conjecture that the Austrians were in the Staffalo valley, that they actually had their backs turned to them.

Lieutenant-General Hartung, the commander of the Ninth Corps, determined on his own responsibility to undertake the attack of the Monte Croce; but certainly too late, and with insufficient forces. The untimely fire of two Austrian guns had betrayed the presence of the Austrians long previously. But, what was worse, there was not sufficient artillery available to prepare the attack, which just now was especially essential. There was only the battery of horse artillery of the Corps Reserve on the spot, in addition to the two brigade batteries, and these batteries were much too far off. The infantry might have got out of the difficulty, by approaching the enemy with the fire of numerous swarms of skirmishers. But the attack was allowed to take its course, and the two brigades as well as the Brigade Scucher of the Seventh Corps, which had attached itself to their right, were obliged to return through the Staffalo valley, and were, like the three brigades at Nachod, unfit for further employment during the day. An attempt was then made, in an incom-

prehensible manner, to seize upon the Belvidere: it was indeed captured, but it could not be held.

The third attack with the last reserve—the two still intact brigades of the Seventh Corps—undertaken on the own responsibility of the officer still commanding them, Lieutenant-General Maroicic, was also directed against the Belvidere, and had this advantage over the others, that the attack took place under cover of the combined batteries of the corps, that the brigade batteries then accompanied the attack, and that shortly after, the reserve artillery of the corps was brought up, when the Belvidere had been taken.

A very effective fire of forty guns at short range now ensued from the heights of the Belvidere, and "Monte Molunenti," supported by the artillery reserve of the Ninth Corps from this side of the Staffalo valley, and which rendered the enemy incapable of resistance.*

The Brigade Möring of the Fifth Corps assisted in the attack on Custozza. The Monte Croce was taken by the regiment Maroicic of the Ninth Corps. It has been our principal object to show how, on every occasion where a proper preparation was made by the artillery, and especially at short range, the attack of the infantry succeeded.

If the Austrians arrived at a correct knowledge as to the suitable combination of the different arms, they obtained no proper insight into the neglect of the infantry fire-fighting: that, they were to make acquaintance with in Bohemia.

Campaign of 1866 *in Bohemia.*

It was by no means the superiority of the needle-gun alone which caused the successes of the Prussian arms in Bohemia, as they would have shown their superiority even with a muzzle-

* "The Account, by the Austrian Staff, of the Campaign of 1866," says, with regard to the attack on the Monte Croce, "The enemy's troops were, owing to the heavy losses which they suffered from the destructive fire of the reserve batteries of the Ninth Corps, so shaken, that they were quite unable to withstand the attack."

loader such as the Austrians had, though perhaps not in so striking a manner. For the last fifty years, active defence had been fostered in the Prussian army, less in its literature than in those directions which emanated from high authority; not so much in the sense of how battles are to be conducted, but as a fundamental basis for the infantry fight. In fact, it is in the active defence that fire-fighting can be turned to its best use, and that fire and attack can be best combined. At the manœuvres, in the fighting evolutions of the smallest detachments, in compiling written essays on tactics, everywhere it served as the indicator for criticism. It may be said that it had permeated the flesh and blood of the army down to the lowest strata. What was so decided in this, was the recognition of the value laid upon shooting, and that its effects must be utilised to the utmost, through the attack which was to follow it up. The result was then simply, that for the attack, where it was ordered, situations had to be procured where the circumstances were pretty much the same, *i.e.* where numerous swarms of skirmishers, under cover as much as possible, could be placed in position opposite to the enemy, and the advantage gained by their fire could be utilised to the utmost, by the attack of small company columns. The knowledge of the importance of taking advantage of the *terrain*, in order that the utmost advantage might be reaped from their own fire, and that of the enemy avoided, that the approach could be made under cover at the double, was not only the result of this, but was practised most thoroughly in peace time; the fighting in skirmish order was reduced to a systematic plan, and thoroughly disciplined; shooting itself, was raised to one of the highest branches of training, and the dexterity of the individual soldier was increased in every respect.

The campaign of 1866 showed the results of this training, or let us much rather say, of this knowledge. The needle-gun with its rapidity of fire, then did the rest.

The act of demoralisation cannot dispense with small-arm

fire in every description of ground, partly, because the artillery fire cannot reach everywhere, partly, because the mass attack of the infantry which follows the act of demoralisation on the part of the artillery, must always require that some additional assistance should be combined with it, in order to complete the "act of fire."

The solid masses of the Austrian brigades, which rushed forward against the Prussian infantry, with few skirmishers preceding them, were decimated, and what was of more importance, they were quite surprised by the unexpected effect; they became quite incapable of delivering a blow, or of standing up to receive one; they were even incapable of making an orderly retreat, for it was here that the fire first took a proper effect upon them.

It is now quite remarkable, that with all this care which was devoted to the infantry fight in Prussia, the employment of the arms in combination was quite neglected. Artillery and cavalry had displayed the same amount of eagerness in their own sphere to partake in that progress which the new arms necessitated. Their tactical co-operation to produce a total effect was not dependent on them, as the object which they had to accomplish had to be indicated to them beforehand, more especially as regards what concerned the artillery. The manner of fighting employed by the French, in the campaign of 1859, was, with respect to the infantry, studied in all directions; on the contrary, what concerned the employment and the performances of the artillery, remained quite unnoticed.

This may be attributed materially to the position of the Prussian Head-Quarter Staff, which is the only mouthpiece where the employment of the troops is concerned, and is paramount in military literature. What does not emanate from, or is not stirred up by them, remains dead, and at that time its interest as regards the artillery had not awoke.

The theory of making use of forces piece by piece, until the last intact reserve is reached, with all its consequences, amongst which may be especially noted, the splitting up of the artillery,

and the employment of the artillery mass for the first time in the final act of decision, was considered as the only valid one, and as being alone suited to the nineteenth century. We have characterised and gone back to the origin of this method of carrying on a battle more closely in previous pages, under the heading "Methodical Fight." We shall see that it throws its shadow deeply into the campaign of 1866.

The attention which Prince Frederick Charles had devoted to tactics in general, had been extended to the employment of artillery, and caused him to employ it before Missunde in an extensive manner. Owing to the fog however, the day was not favourable to this arm. On the other hand, Düppel demonstrated the extraordinary effect of the Prussian artillery, and caused the performances of the rifled guns to be known to an extent which astonished all the world. But it was not only in the attack of the redoubts by the guns, but also in the storming of them on the 18th of April, 1864, and by the immediate crowning of the heights which had been captured, that the field artillery was employed in so superior a manner, that a new era appeared to have arisen for this arm. The campaign of 1866 completely disabused these hopes.

It was soon self-evident that the employment of artillery as had resulted in 1864, had been quite of a personal nature, and had not exercised the slightest influence on the tactical views of the army. Not only that the infantry fight was exclusively made the basis on which the disposition, and then the order of march was founded, but the maxims of the methodical fight were partially expressly recalled to mind. On the day before the march into Bohemia, it was as we have been assured, laid down in the First Army Corps, that in case of its coming into action, one-third was to be employed in commencing the fight, one-third was to be used to support and reinforce the first third, but the remaining third was to be kept back for the decision. The battle of Trautenau, on the 27th of June, 1866, was carried on completely in this manner. We see from this that the "Gros"

which happened to reach the Aupa two hours before the advanced guard—as it had marched by a different road, and really considered that it ought to wait for the advanced guard—did not occupy the heights lying in front of it. This was done by the Austrian Brigade Mondel, which had in the meantime arrived.

The attack of this position presented extraordinary difficulties; besides, it was impossible to know what was behind it.

It was incumbent on the First Corps, that it should reach Arnau on the following day; consequently, it was necessary that they should previously clear away any obstacles which might threaten their flank. For this purpose, besides the advanced guard and the right side detachment, which had received the command to take the height occupied by the Austrians in front, first of all three battalions, and soon after three more battalions of the "Gros" with only one battery, were directed to attack the enemy in the right flank. What a difference in the conception as compared with 1870! When the Third Army wished to cross the French frontier on the 4th of August, the column of the right wing (Bavarian) met with opposition, and the Fifth and Eleventh Corps were immediately directed by the initiative of their own commanders to attack the enemy. At Trautenau, on the contrary, where the forces were altogether, nearly one-half of the corps were allowed to remain passive spectators. There was but the third of the force at stake; at the same time such care was taken to withdraw every possibility that the remainder might be able to take part in the fight, that they were left in the lurch.

According to the maxims of 1870 the whole Corps Artillery, and the artillery of the "Gros," should have been directed upon the heights of Wüblitz, and the "Gros" should have been posted near to it.*

* As the four-pounder battery succeeded in ascending the heights, the other rifled batteries might certainly have followed. It does not appear to have been possible for the smooth-bore batteries to have ascended the heights.

Instead of this, only eight batteries were brought into action during the whole fight, and principally in order to cover the retreat. The Corps (reserve) Artillery was employed in taking up positions to the north-east of Trautenau.

It is not our intention to penetrate further into the details of this day—in other respects very honourable—as they are by no means pleasant as regards the First Army Corps. We only wished to demonstrate how destructive theories may become, and what the ideas of the authorities in command were with regard to the employment of artillery. The brilliant battle at Nachod was fought almost entirely without the artillery participating in it. The six batteries of the reserve artillery, were in the order of march, placed at the tail end of the whole corps, even behind the reserve battalions. The advance guard was too sparsely provided with artillery, and its batteries were like those of the "Gros," separated when in the order of march, by battalions, so that any simultaneous employment of the artillery was out of the question. It was evident that the idea which had been formed was, that the batteries were to be used singly to support the infantry fight, and to be brought on the scene *en masse*, when the final act of a battle which was being carried on in accordance with the rules of the methodical fight, was being accomplished.

The results were consequently very deplorable. Only the batteries which formed a portion of the advanced guard came into any lasting activity; the batteries of the "Gros," which arrived very late, and were brought into action one by one, were immediately placed *hors de combat* by the Austrian reserve artillery, which in the meanwhile had been placed in position as soon as it came within range of them, and the batteries of the reserve took part in the fight for the first time, when the decision had been actually brought about.

Had the maxims of 1870 been in force, the advanced guard would have had three batteries assigned to it, and those of the reserve would have followed the first brigade of the "Gros."

Fortunately the deficiency in artillery resulted in no material disadvantage. The superior manner of fighting of our infantry and the superiority of the needle-gun, quite compensated therefor. Thrown on the defensive, the battle assumed for the Prussians a defensive form with an offensive character, and showed anew the superiority of this manner of fighting. It would be supposed that a slight reflection over the events of this first day* would have resulted in a more favourable disposition of the artillery—which at least would have given it the possibility of attacking in a more advantageous manner — being brought about. Quite the contrary; the manner in which the artillery was disposed on the day of Skalitz, gave it even less chance of taking part in the various phases of the fight with successful results. This interesting fight will justify our going more closely into it.

In accordance with the orders issued from headquarters, on the afternoon of the 27th June, the line was, in the advance on the 28th to be transferred to Kosteletz, for which place the first section of the ammunition columns, the pontoon train, and the whole of the baggage, were to set off by way of Nachod, at five a.m. This took place in pursuance with orders issued from the Headquarters of the Second Army, and was necessary on account of the general situation. The support of the Second Infantry Division of the Guards from Kosteletz, was also promised on the part of the Commander in Chief.

The General commanding, consequently directed the Detachment Löwenfeld to leave its bivouac at Nachod about seven a.m., and proceed towards Studnitz, in order to advance from thence against Skalitz in conjunction with the Second Guard Infantry Division.

The actual advanced guard (Voigts-Rhetz) was pushed forward about eight a.m. to the south of Starkoc, and the "Gros" (Tenth

* For a plan of the country and positions of the combatants on this and the following day's fighting, *vide* the excellent map issued with the Austrian official account of the campaign in Bohemia. A map of the same *locale* is also published with the official translation of the Prussian account; but it does not give so good an idea, as the position of the combatants is not shown.

Division) was directed to proceed to Wysokow, where in the broad ravine-like village street, massed in close columns, it was to await further orders. The reserve artillery remained behind the "Gros." Hoffmann's detachment from the Sixth Army Corps was stationed to the south of Wysokow, on the slope near to the small wood.

About nine o'clock, General von Steinmetz issued the following dispositions:

"Major-General von Löwenfeld on arriving in Studnitz is to wheel to his left in order to gain the direction towards Skalitz; arrived on the *Schafberge*, he is to take up such a position north-east of Dübno, that he will, with regard to the position taken up by Colonel von Voigts-Rhetz and Major-General von Hoffmann, constitute an offensive flank against the hostile left wing.

"While Major-General von Löwenfeld is advancing, Colonel von Voigts-Rhetz is to proceed in a westerly direction; Lieutenant-General von Kirchbach is to follow north of the road, Wysokow-Kleny, behind Colonel von Voigts-Rhetz, but in échelon on his left. Major-General von Hoffmann is provisionally to remain in his position, and support the attack according to circumstances and his own discretion. Orders will be given when the moment for the attack has come."

The disposition consists evidently of two parts, the first of which has in view the position being kept inactive until the arrival of the guard division; the second has reference to the attack. The offensive flank of the Löwenfeld detachment, etc., can only be considered as a part of the position which had been taken up to await the arrival of the guards, and as having nothing to do with the disposition for the attack. There is therefore no question as to an attack of an échelon nature, from the right wing, with the point directed against the enemy's left, and a flank attack upon the same by Löwenfeld's detachment, besides there was no occasion for it, because here the Second Guard Division was to work in. When about quarter to eleven, information was received that the latter was no longer to be counted on, and the

general in command ordered the attack without any modification of the disposition, it developed itself chiefly in this manner, viz., that the Detachment Löwenfeld, as well as the advanced guard, in addition to which were two battalions of the Thirty-eighth Infantry Regiment, belonging to Hoffmann's detachment, which had pushed themselves in between the two former, made use of the protection which the "Fasanerie" afforded, to advance, so as to withdraw themselves from the effect of the enemy's artillery. At the same time the "Gros" arrived.

According to the disposition, the latter should have followed the advanced guard echelonned on its left, so that the left wing brigade of the Tenth Division would have taken the direction of the Skalitz railway station. Owing to the sharp turning which the road makes at Kleny, it was necessary to adhere literally to the disposition, which does not allude to the Wysokow-Skalitz road, but to the Wysokow-Kleny one, so that beyond Kleny it would have been necessary to quit the road, consequently the attack, made in the open, would have been exposed to the full effect of the Austrian artillery.

The commander of the Tenth Division determined, therefore, to march by Dübno upon Zlitsch, and developing his attack between Zlitsch and the northern boundary of the "Fasanerie," advance against the enemy's left wing. Moreover, the "Gros," by this manœuvre, was placed in a right situation as regards its line of retreat, and did not mask its own artillery, which, as the circumstances were at present constituted, found a suitable field for its activity at Kleny, and in front of the village. The attack on the enemy's left wing, which, owing to the non-arrival of the guard division, had remained in abeyance, was thus, not only again taken in hand, and the original intention of the disposition carried out, but meantime such favourable conditions intervened with regard to this movement of the Tenth Division, that it became one of the most startling manœuvres of modern military history.

The Löwenfeld detachment, the two battalions of the 38th, and the advanced guard under Voigts-Rhetz, had easily cleared

the "Fasanerie," and the oak plantation, which was merely occupied with one battalion, and some *jäger* detachments, and had established themselves against the Austrian left wing. But it would have been a matter of the greatest difficulty to continue the attack from hence, as the half battalions, in working their way through the wood, had completely lost their tactical cohesion, and a formidable artillery drawn up on an arc stood opposite to them at a distance of 1200 paces. The Austrians helped them out of this difficulty, as they themselves assumed the offensive. With regard to the details of these events, we refer our readers to the admirable account in the "Critical and Uncritical Wanderings." The result is enough for us here. The Prussian half battalions and the needle-gun, demolished the Austrian Brigades Fragnern and v. Kreyssnern on the west boundary of the "Fasanerie" in a manner that the united artilleries of the whole world could not have accomplished better, so that the attack by the Tenth Division was enabled to ensue quite smoothly, and without artillery. There remained only the attack on the town, in which the artillery took its share.

What had the artillery done to bring about the decision, and what dispositions regarding it were made? The fact is, that scarcely any dispositions regarding it were made at all, hardly any commanding officer troubled himself on the subject; it was much more owing to its own dispositions that it came to be placed so, that with the best intentions it could do very little.

The reserve artillery on the breaking up of the bivouac, had received orders to follow the Tenth Division. The disposition makes no mention of this. When the Tenth Division on advancing to the attack, in crossing the field towards Dübno, came upon ground where the artillery could neither follow it nor have any prospect of producing any effect, the officer commanding the reserve artillery led its four rifled batteries into a position east of Kleny. In so doing, he did the best which could under the circumstances have happened, as he at least drew off the enemy's artillery fire from the infantry.

The reserve artillery remained here till that of the enemy withdrew.

The three rifled batteries of the Tenth Division, the rifled battery of the advanced guard, and one of the Hoffmann detachment had taken the direction of Kleny. All these batteries had gone there singly, and, for the greater part, on their own responsibility. Three of them took up a position westward of Kleny, and on each side of the road. The two rifled batteries of the Löwenfeld detachment at length arrived here—having come by way of Dübno—and took up a position to the south of this farm on both sides of the railway. They had found no suitable situation to the north of Dübno, and it was impossible for them to take up an isolated position upon the heights of Zblow at a distance of 1000 paces from their detachment, as long as Zlitsch was occupied by the enemy's *jägers*.

The smooth-bore batteries were scattered all over the battlefield, but kept out of fire.

It would be difficult to justify the employment of artillery in this manner. It is evident that the reserve artillery could already, on the advanced guard pushing forwards, have occupied a position to the east of Kleny, and by so doing they would have saved the infantry advancing through the "Fasanerie" from suffering considerable loss. But an order from those in command would have been necessary for this, as very probably other intentions might have been had as to their movements. The divisional batteries attached to the troops, should likewise have had orders issued to them to advance, and take up a position, as the state of affairs was anything but simple. In addition to this, the state of affairs as regards the Tenth Division was peculiar, and made it essential that proper dispositions with regard to the batteries should have been made. During the time the force remained waiting in the position at Wysokow, the batteries should have taken up positions in accordance with orders which should have been issued by superior authority, as follows, viz,, the First six-pounder Battery of the advanced guard, the Third six-pounder,

and Third twelve-pounder Batteries of the Tenth Division on the plateau to the south of Starkoc, the Third and Fourth four-pounder to the north of Wysokow, pointing towards Kleny. It is quite certain that the last two batteries also belonging to the Tenth Division were assigned to the advanced guard. They were also ordered by its commander to take up the position to the north of Wysokow. Probably the first-named batteries were also assigned to the advanced guard, as they were certainly with it, at least the Third six-pounder Battery advanced later on with the advanced guard, passed Kleny, and took up a position to the north of the village. The Third twelve-pounder Battery, on the contrary, remained behind on the forward movement of the advanced guard, and marched off later with the Tenth Division by way of Starkoc.

The Third and Fourth four-pounder Batteries, on the other hand, may have been under the impression that they were intended to take up a position in the place which had been specially assigned to them. No order was given to them, besides, the two battery commanders were absent on a reconnaissance, when the Tenth Division marched off. When they returned, they found themselves completely isolated, and at length came to the determination to advance. The Third four-pounder Battery attached itself to the reserve artillery at Kleny, the Fourth four-pounder Battery endeavoured to find a ford over the brook to the north of Kleny, got into impassable ground while trying to do so, and only got to the other side when the hostile artillery had already taken its departure. It then advanced along the main road, and when it reached the "Fasanerie," it again met with the officer commanding the advanced guard, and was directed by him to the left wing. Here it came across the Third Battery, which had already taken the same direction, and was firing against the railway station. The Fourth four-pounder Battery went farther on, and took up a position nearer to the southern part of Skalitz, later on, passed the railway on the road to Spitta, and continued in the pursuit as far as Aupa. The Third twelve-pounder Battery

had followed the Tenth Division through Zlitsch, the Fourth twelve-pounder Battery, which had remained on the Schafberge after the departure of the Lowenfeld detachment, now also followed as far as there. Both batteries came into action against the northern boundary of Skalitz.

It is perfectly evident that when the dispositions for this fight were being made out, not the slightest consideration was paid to the employment of the artillery. Another disposition of the forces ought to have been made, and it was undoubtedly required for other reasons.

The Detachment Löwenfeld should, immediately the co-operation of the guard division could no longer be counted on, have been ordered to proceed through Zblow to Zlitsch, to attack the Austrians' left flank. This was already necessary, in order to open the way here for the debouching of the cavalry brigade of the guard, and to prevent any reinforcements reaching the Austrians, by barring the defile over the Aupa. The advanced guard, and the two battalions of the Thirty-eighth Regiment were sufficient to force their way through the "Fasanerie." The Tenth Division, under these circumstances, should also have taken the road, which it subsequently took on its own initiative. The Hoffmann detachment would have served as reserve to the advanced guard, and have protected the artillery position at, and in front of, Kleny. With this disposition, five or six rifled batteries could have been placed on the heights to the west and south of Zblow, the remainder at Kleny, both from the very commencement of the fight. The batteries of the Löwenfeld detachment, and those of the Tenth Division, should have been posted at Zblow ; the reserve artillery, the batteries of the advanced guard, and of the Hoffmann detachment, should have been posted at Kleny. It is quite understood, that when the infantry fight advanced, they should also have gone nearer. The smooth-bored batteries might have first remained in reserve, then they might have crept up closer. They did not advance at the battle of Skalitz until the enemy's artillery had quitted the field. The two

horse batteries of the reserve artillery, and those of the advanced brigade, which had remained behind to the west of Wysokow, were pushed forward on the main road after the hostile artillery had moved off, and after the northern boundary of the town had been taken, took up a position to the north of it, in order to fire upon the retreating enemy on the other side of the Aupa. We have already remarked on the part which the two smooth-bore field batteries took in the action. Experience like that of the 27th and 28th June must, as regards the employment of the artillery, have produced a most convincing effect upon the commanding officers concerned. On the following day a most marked improvement showed itself. Although the divisional batteries did not yet march united, in the case of the advanced guard, they were, in spite of the great difficulties which the circumstances of the locality presented, and although the formation of the infantry was materially retarded thereby—immediately brought to the front, so soon as the determination to attack the enemy had matured. We have already, in connection with the battle of Custozza, expressed ourselves as regards this determination and its importance. Here we meet the same commanding officers of the Tenth Division, who had come to a no less energetic determination to deviate from the original disposition as the circumstances required.

In the battle of Königgratz, the wood of Maslowed played the same rôle with regard to the preparation for the attack of the Second Army which followed it, as did the "fasanerie" in the battle of Skalitz, but under circumstances on a much larger scale. It absorbed the force of two Austrian corps, as did the "fasanerie" that of two brigades. The infantry fight here thus completely carried out the object, which otherwise the united artillery mass of several army corps would have had to have done. The attack of the First Guard Infantry Division was then enabled to take place immediately. In addition to this it was supported by the reserve artillery of the Guard corps. It was a great improvement that the reserve artillery did not march

in rear of the army corps, but followed the First Division. The battle of Sohr, where, in consequence of the unfavourable order of march as regards the artillery, the reserve artillery of the Guard corps could not take up its position, had brought about this improvement. The battle of Königgratz, considered abstractedly, but more especially from the above points of view, and in other senses, was fought in accordance with the principles of the manœuvre battle.

Although it is not necessary in planning a manœuvre battle that its last operations should require strategy being actively brought into play, nevertheless, these constitute a material help towards its introduction, and again, the manœuvre battle is an actual necessity for strategy, because the latter must always be in a position to overlook and foresee the entire consequences of the battle, and be able to direct the attack against the right place in accordance therewith. In the methodical battle it is not possible to determine with the same certainty the direction in which the final blow, in which also here the battle culminates, is to be delivered, as in the course of the fight everything gets too much mixed up, and there are a mass of collateral circumstances which will always exercise considerable influence.

The battle of Königgratz is the result of a strategy which had placed its own forces in the most advantageous position as regards their tactical employment. In this respect, as well as from the energetic determination to strike, from the rapidity with which our forces gripped hold of the enemy, from the way in which the forces scattered about were directed upon one point, and from the manner in which it was carried through, this battle will always remain as a masterpiece of the art of war.

The decided character which was impressed on the defensive fight of the First Army, was quite suited to impose on the enemy, and at the same time to keep him confined to the position in which he was; at the same time it was methodical, and the risk was small. The rifled guns, by their great range, and

by their power of warding off an attack, showed that they were capable of exercising great influence on the conduct of battles of this nature, while the superior needle-gun inflicted grievous losses on the enemy in the wood of Maslowed, and secured for itself all the advantages of the defensive.

In consequence of this, the Second Army, on making its flank attack, found all opposition broken, and was thus enabled to utilise to the utmost all the advantages which the surprise conferred on it. Above everything, the blow was delivered exactly on the right spot, and was in addition so favourably formed in the direction of its depth, that the divisions and corps following each other, arrived exactly at the right time to be able to support the first detachments which had been nearly destroyed by the enemy's reserves, and even to push on beyond them. The attack which the Elbe Army was to carry out had not such advantageous circumstances to favour it, and since a suitable artillery position was not available, it did not make any advance until after the first success had been obtained against the wing which was opposed to it.

With the battle of Königgratz, the manœuvre battle was adopted into the Prussian army. The knowledge of how effective the attack *en masse* was, and the knowledge also that if this attack was to be secured from fortuitous mishap, it was necessary to prepare the way for it by the fire of a mass of artillery, had become common property. How very much the experience gained in the first days after the commencement of the campaign had to do in bringing this about, is evident from the simple circumstance that nearly all the corps of the Second Army, when marching on to this battle, found it necessary when nearing the battlefield, to bring the reserve artillery, which had been marching in the rear, to the front, and also to combine the divisional artillery into one detachment. This was most extraordinary progress.

If, nevertheless, during the following years of peace, the old ideas as to the employment of the reserve artillery still tried to struggle to the front, it is only a sign of how deeply rooted the

old doctrines and maxims were. Fortunately the positive orders issued before the outbreak of the war with France, prevented any evil consequences arising therefrom. But it was necessary that they should first be thoroughly engrained, and doubtless much bitter experience would still have had to have been gained with regard to the employment of artillery, had not those individual generals who had had especial occasion in the campaign of 1866 to reflect on the employment of the combined arms, taken the initiative themselves. The Generals commanding the Fifth and Eleventh Corps distinguished themselves in this respect immediately on the commencement of the campaign of 1870. It is, therefore, only a mistake when it is asserted that the predominant employment of the artillery in this campaign, was called forth on account of the immense superiority of the enemy's infantry firearms. At Weissenburg, immediately after the first information had been received as to the fighting situation, the General commanding the Fifth Army Corps issued orders for the advance of the corps artillery, and the latter had on its own initiative, before the order was received, trotted off at the sound of the first cannon shot. The same took place at Wörth, where the united artillery of the Fifth Army Corps was already in action before the head of the infantry column of the "Gros" had arrived. The whole of the batteries of the Eleventh Corps also participated in the fight. We see that the experience gained at Nachod and Skalitz had produced its effect, and the brilliant successes of the infantry in these combats, in no way deterred the officer then commanding the Tenth Division from making a much better use of his artillery than he did on that occasion. But the same thing took place in other corps with but few exceptions. At Colombey-Nouilly, the whole of the batteries of the First Corps were drawn into action immediately they arrived. Seven batteries of the Seventh Corps, however, could not be employed, nominally, on account of there being no room to put them in position. The First Division Field Artillery might certainly have assisted the Brigade Hoyna in its combat, and

have found room near the First Light Battery. It was the duty of the corps artillery to have done this after the heights to the west of Colombey had been taken. The artillery, however, cannot be blamed for this, as they were on the spot soon enough. Then there was the brilliant manner in which the artillery of the Third and Tenth Corps behaved at Vionville.

The American War.

BEFORE we enter closely into the subject of the campaign of 1870, we must think of the American War, in order that its events may also be considered.

What stands out most prominently, is the great superiority of the defence when, as here, the assailant has neither trained troops nor generals who had had much experience in war. In fact, owing to the introduction of rifled firearms, the defence has gained in a much greater degree than the attack. Owing to the greater distance at which rifled firearms have made it necessary that armies should keep apart, and consequently on account of the greater space that the assailant has to traverse, the defence is in a much better position to counteract the attack, as it gains more time to bring up its reserves to the threatened points. Moreover, it receives timely notice by the concentration of fire upon the point of attack. To this may be added, all the advantages which fighting in a position under cover, and the power of being able to use their firearms to the greatest advantage, confers on the defender. The practice of the Americans to intrench themselves in every position, and even when forming their camp after the day's march, was kept up in an extraordinary manner. The effect of rifled field-guns against earthen breastworks is too feeble, and that against the interior of the redoubt is very problematical. When the assailant has even done his utmost to open the position, it is nevertheless masked during the advance of the troops, and the latter again are exposed to great loss during their advance against it, as they have a longer distance to traverse. Whether the artillery

can approach nearer, and accompany the troops, is always contingent upon the possibility of the ground presenting nearer positions suitable for it. It lies in the power of the defence to prevent this by making skilful use of the *terrain*. When the assault is thus weakened by losses, and by the exhaustion of the troops making it, the attack soon becomes feeble, unless its formation is of considerable depth. It is very easy to bring it to a standstill by developing a strong line of fire. Artillery, owing to its mobility, is particularly suited for this purpose.

The performances of the American artillery in this respect are quite extraordinary. The fact that they still carried a large number of smooth-bored guns with them was of great use, as the case-shot which they always made use of, produced a most satisfactory result in the defence. In the battle of Murfreesboro, the 31st December, 1862, Rosencranz's right wing was surprised in such a manner in the early morning, and on account of a thick fog, that it found itself in an utterly defenceless condition. Johnson's division of the right wing, and Davis's, which followed it, were completely overthrown. Sheridan's, which followed, and endeavoured to form a salient angle against the enemy, was utterly unable to do so. The whole of the right wing was rolled up, and retreated in disorder behind the centre, where Rosencranz was obliged to stand fast with it, and with his left wing, without being able to send off any supports, as he had the enemy immediately in his front, who was only waiting to hurl himself upon him should he show the least signs of weakness. He therefore only took the batteries of his reserve artillery to the right wing of his centre, and placed them at right angles to his line of battle in a V formation (*haken*).

The right wing re-formed itself under shelter of these guns. The reserve batteries opened such a murderous fire upon the enemy, that he was obliged to relinquish his pursuit. Rosencranz was enabled to assume the offensive a few days later.

In the battle of Chancellorsville, on the 2nd May, 1863, the Federal right wing under Hooker was surprised in a similar

manner after crossing the Rapidan, this time, however, by the aid of a thick wood, and Howard's Eleventh Corps was put to flight in less than half an hour. It was again the fire of the reserve batteries of the corps in its immediate vicinity (Sickle's Third Corps) which stopped the enemy's advance.

On the first day of the battle of Chickamanga, the Federal left wing was likewise utterly disorganised by similar energetic attacks on the part of the Confederates. Reynold's division, which was next to it, and Johnson's division, which had hastened up from the reserve, succeeded in keeping up a sufficiently protracted resistance to enable General Rosencranz to hasten up with fresh troops and with the reserve batteries, and General Thomas to reassemble the disordered divisions of Baird and Branon, and to lead them himself to a fresh attack.

In the fights about Atlanta, to which I shall refer farther on, similar results with the artillery were repeated on three different days, viz., the 21st, 22nd, and 28th July, 1864. In the battle at Franklin, on the 30th November, 1864, the centre of the Federals was broken through after a most desperate resistance. General Stanley posted three batteries of the Fourth Corps behind that part which had been pierced, and succeeded in driving back the hostile columns with their fire.

The Confederates repeated the attack three times, and fought with increasing desperation ; but they could not succeed in withstanding the murderous effect of the case for any length of time, at the same time that Shoffield, the commanding officer, brought the whole of the reserve batteries and the batteries of the Twenty-third Corps into action upon the other side of the Harpeth, and brought a most efficient fire to bear upon the attacking columns from that side.

Although the attack may have had greater difficulties to overcome since the introduction of rifled firearms than previously, it still remains the one "form" which can alone bring about a decision, for no war can be carried on with defensive battles only.

The American infantry were wanting in that tactical discipline

and thorough training necessary to carry on a fight in the same manner as the Prussian infantry would. Although they may have had good rifle shots in their ranks, these were merely marksmen, accustomed to fight in dispersed order, and existed near the main bodies (line formation), but were not able to constitute such a formation themselves. It was just as impossible to permit these bodies of men to disperse themselves, unless it was intended that all control over them should be lost. Moreover the American nature urged for the individual onslaught, so that, in this respect, a close combination of fire and attack never took place in the infantry fight. Consequently, after the armies had evolved a certain amount of tactical order from the chaos which had originally ensued, owing to their enormous increase, a system of attack-tactics arose, similar to those adopted by the Austrians since 1859, where the fire-fighting devolved almost exclusively upon the artillery. But there was just as little system behind it, as was the case with the Austrians.

It is not so difficult by means of the concentration of the artillery forces, and by the subsequent attack, to pierce and effect a lodgment in one point of the hostile position, as to maintain this point against the attack of the enemy's reserves. The assailant requires considerable depth to be given to his force of three and more lines, and also that his artillery should be rapidly brought up in order to co-operate with it. Where the *terrain* allows, cavalry would be here in its right place, in order to fall upon the hostile reserves and to keep them back. In the first campaigns this arm was entirely wanting. The battles of Gettysburg on the 1st and 2nd of July, and of Chickamanga on the 19th and 20th of September, are particularly interesting in this respect. The attacks of the Confederates in the first battle would have completely assumed the character of a manœuvre battle, if the attacks—made by one corps after another, but with such great intervals of time elapsing between them that the impression made by the first had completely vanished before that of the second began—had occurred with much shorter

intervals between them, and if a corps had followed immediately behind the first line as a reserve. Made in this manner, they were merely isolated attacks, to which the defender was always able to oppose superior force. The circumstances at the battle of Chickamanga in the more central theatre of war, a few months later on, were very similar, only that the Confederates, by a simultaneous engagement of the whole of the enemy's front on the second day, and by skilfully taking advantage of a mistake, at all events won the victory. There is here no talk of any very skilful movements, and the original intention of routing the Federals' left wing, in order to drive them back from Chickamanga, was not attained; the latter not only succeeded in getting there safely, but were quite able to maintain themselves when there, so that later on they were able to assume the offensive, and with more success. In Grant's and Sherman's battles, we find the same scantiness of organisation as regards the depth of the attack.

The unfortunate idea of Grant's to operate against both wings of the Confederates in the battle of Spottsylvania on the 10th of May, 1864, when Hancock's advantageously advanced position laid their left wing completely open, must be regarded as the cause of all the reverses which followed. Grant should have obliged Burnside's corps to follow that of Hancock, and not have sent it against the other wing.

Lee's generalship, in leaving the position dependent on its natural strength for protection, and assuming the offensive against Hancock, whom he drove back, was masterly. Owing to the great disparity of his forces, 70,000 men against 100,000, he at all events only succeeded in driving back his very superior opponent.

An unfortunate time now set in for the Southerners. The North had determined to prosecute the war with the utmost energy, and had entrusted General Grant with the supreme command over the whole of its forces. Grant himself assumed the direction of the Army of the Potomac, which was to deliver the principal blow, and gave the command of the united Cum-

berland, Tennessee, and Ohio armies to General Sherman. Both generals were provided with the necessary superiority in numbers over the Southern armies which were opposed to them, and it was quite justifiable to hope for a speedy termination of the war. The Northerners were greatly deceived. The Confederates had prepared their theatre of war so admirably, that they manœuvred unbroken from one position to another; they always succeeded in raising their heads afresh, and despite all the energy with which the blows were delivered, they could not be killed. The campaign of 1864, at all events, was unable to put an end to the war.

The result, however, was the eventual demoralisation of the Southern armies, owing to the everlasting retreats, the continually having to intrench themselves, and the endless battles, without any perceptible impression being made on their opponents, who merely withdrew in order to attack them from another side. The battles around Atlanta are of great interest in this as well as in other respects.

The Battles around Atlanta, from July 20th to August 4th, 1864.

SHERMAN had set himself in motion simultaneously with Grant. He commanded an army of 98,000 men, with 254 guns, whilst Johnson, his opponent, had only 71,000 men to oppose to him.

In spite of his superiority, Sherman succeeded neither at Reseca on the 14th and 15th of May, nor at Kenesaw on the 27th of July, in driving his opponent out of the position chosen by him. In order to avoid having his communications cut, his opponent was eventually obliged to retire upon Atlanta. The Federals had still 78,000 to 80,000 men, while the strength of the Confederates was only about 49,000 men.

The town of Atlanta had been secured against hostile corps some time previously by a girdle of earthworks, but the Confederates had lately very much increased and strengthened these

works. In planning them, a row of hills had been advantageously made use of. These hills surrounded the town, in the shape of a ring. In addition to this, the difficulty of approaching the town was greatly increased by a number of small brooks, with high and steep banks, running from east to west into the Chattahoochee, amongst which the Peach Tree and the Proctor are the most important, as well as by the surrounding country, which is very wooded, and has a number of gullies and other inequalities.

Sherman commenced his operations against Atlanta on the 14th of July, by taking a north-easterly direction, after leaving a small *corps d'observation* behind him, and he crossed the Chattahoochee at Roswell, and below that place, on the 18th and 19th. It will suffice, without following his operations in detail, if we mention the chief features.

Hood had just assumed the command of the Confederate forces, and could not himself oppose their crossing the river. True, he seized the opportunity on the 20th, when the Federal columns, which were engaged in the march upon Atlanta, had not yet become reunited after crossing the river, and were extended from the Chattahoochee beyond the railroad, groping their way in uncertainty towards each other—and threw himself, taking advantage of the thick woods to shelter his approach, with such overwhelming superiority upon the isolated divisions of the Cumberland Army, which constituted the Federal right wing, that Sherman was in great danger of being beaten in detail. Here also it was the artillery which first succeeded in checking the Confederate success, for Captain Goodspeed, commanding the artillery of Newton's Division, which was the one in most danger, brought ten guns into position on the left, and four on the right wing of the division, and stopped the Confederates, who until then had been rapidly advancing. The murderous case-fire had broken the force of the attack. The Confederates began to fire, then held their ground for some little time, and finally retired before the combined forces of the

Federals. Hood withdrew his army into the position of Atlanta.

After Sherman had approached Atlanta on the 21st, and had resumed the line of operations which had been abandoned for the moment, thereby exposing his left wing, Hood threw himself upon it on the 22nd at midday. Blair's Seventeenth Corps, and a part of the Sixteenth, Dodge's, which was hastening to his assistance, were routed, until at length the Fifteenth Corps, Logan's, succeeded in forming a V, and by a murderous cross fire from the batteries which hurried up on all sides, to bring the Confederates to a standstill. An attack which Sherman caused to be made at the same time as this, by his right wing upon the fortifications in the front of Atlanta, met with a bloody repulse. Mutual exhaustion necessitated rest for a few days. On account of the strength of the hostile position, Sherman again had recourse to manœuvring, and in the night of the 26th and 27th he withdrew his left wing, the Tennessee Army under Howard, behind the other one which was in front, to his extreme right wing, in order to operate against Hood's line of communications, viz., the Southern railroad.

In order that his new left wing might be secured against a fresh attack, he caused it to assume a V shape.

The Tennessee Army had not yet established itself in its new position, when Hood fell upon it on the 28th at midday, with such a superiority of force, that it was only by exerting all its powers that it was enabled to hold its ground. Howard united the whole of the sixteen batteries in a V shape behind his right wing in order to prevent any possibility of his being enveloped.

Hood therefore did not succeed in his intention of gaining a material success, and withdrew into the position of Atlanta, but had imbued the Federals with such respect, that from henceforth they endeavoured to reach the Southern railway with the greatest circumspection, by continually lengthening their wings, as the left wing pushed itself on to the extreme right.

The railroad was so nearly approached on the 4th August that

only one hostile redoubt remained to be taken, which covered the approach. An attack on this, made by the Fourteenth and Twenty-third Corps, was nevertheless repulsed in such a bloody manner by masked batteries—Hood had placed two entire corps behind it which were completely prepared—that Sherman determined to withdraw the whole army, and for the present to give up the whole undertaking, in order to make preparations for a very extended flank movement.

Superior as the defence thus shows itself from a tactical point of view, it is devoid of result strategically. The assailant will always have the power of making flank movements at his command, which will exercise a never-failing influence upon the necessities of armies with regard to the supply of *munitions de guerre et de bouche*, especially with regard to the security of the railroads. But the campaign of 1864 and 1865 in North America, shows also how little the defence, even when skilfully led tactically, is able to make up for a great disparity between the numerical forces. The object of the defence must be directed just as well to the demoralisation of the enemy's fighting powers, and when the armies are equally good, the forces should be as nearly in equipoise as possible. Should this not be the case, the defence can only work with the view of gaining time, which under circumstances is undoubtedly of great importance.

The great object of the attack is to bring about a rapid decision; it can, therefore, only set to work to encompass, when its forces do not suffice for a tactical decision, be it in material, moral, or intellectual respect.

We must therefore look elsewhere in order to study the means of the attack, and for this, amongst those Federal generals who were entrusted with lesser commands, are to be found some tactical capacities, notably Thomas and Sheridan.

The battle of Nashville, lasting two days, on the 15th and 16th December, 1864, afforded Thomas an opportunity for showing his tactical skill. It was the enveloping of the enemy's left wing on both days, which by means of demonstrations against

the opposite wing was not only concealed, but the defender was deceived by it to such an extent that he was induced to weaken the wing which was to be surrounded. As the Americans, owing to the want of training on the part of their infantry, were unable to have recourse to the methodical fight in order to keep the enemy to his position and to make a feigned attack, Thomas had recourse principally to the artillery fight for this purpose, in a similar manner to that of Prince Frederick Charles at Königgrätz, enlivening it with isolated attacks by his infantry. Certainly in the present instance, Thomas knew not only how by this means to keep his opponent in his position, but also how to make him weaken his left wing. The left wing which had been surrounded was then suddenly attacked with superior forces and completely demolished. Thomas's opponent was the same Hood whose acquaintance we made in the battles around Atlanta, but who was unable on this occasion to find any opportunity for piercing the web drawn by his opponent.

Sheridan was a harder hitter. What strikes one especially in his manner of conducting battles, is the employment of the cavalry regardless of everything, and the admirable manner in which he supported his infantry when employed in making attacks *en masse*, as they were in four lines one behind the other.

It is not at all improbable that the masterly dispositions for the storming of the redoubts at Duppel had a considerable influence on the final direction which the tactics of the Americans took towards the close of the year 1864, with respect to the deep formation of the attack. At Duppel also, it was the artillery which made the mass attack of the infantry, advantageously organised with respect to its depth, feasible.

It is indisputable, however, that energy on the part of the chief commander, and cautious handling of the rear divisions is necessary, in order that the object to be attained may be kept always steadily in view through those ranks of the front divisions which are broken by the first success or failure, and then also

to engage the enemy's reserves wherever it may be possible to do so.

The enveloping should certainly not be neglected on account of this massing of the infantry forces against the deciding point. It will be necessary that sufficient forces should be spared for this purpose to act against other places, so that a superior force may be collected, and both Thomas and Sheridan were especially remarkable for the manner in which they did this. This glance at the American manner of fighting must suffice. The state of the training of their infantry obliged them to make an extended use of their artillery. Thereby they were taught that method of fighting which we have denoted as "manœuvre fighting," but they did not find the right form for it immediately. It was only towards the end of the war that they succeeded in attaining this, viz., to constitute the attack of the infantry, which follows the effect of the artillery, with a sufficiently proportionate depth. The mere enveloping is not sufficient. Breech-loaders played no part in the American War.

2. *BREECH-LOADER AGAINST BREECH-LOADER. CAMPAIGN OF 1870–71. METHOD OF FIGHTING.*

THE campaign of 1866 dazzled nobody in the Prussian army. It only served to demonstrate the causes of the successes, to fathom the mistakes which had been made. Official instructions made the results of these investigations, as we may well call them, the common property of the army. What is said therein as regards the manner in which the battles were conducted, carries, it is true, merely the character of remarks; the universal features have, however, given rise to contemplations which point out the right place for the two methods of conducting battles, viz., the methodical fight and the manœuvre fight, although they may not explicitly indicate the difference between them.

The campaign of 1870 represents these two methods all the clearer. The battle of Spichern, on the 6th of August, was carried out completely in the sense of the methodical fight, as,

owing to the reinforcements coming up gradually, and to the *terrain* only permitting a very limited scope to the action of the artillery, it was necessary that this method should be made use of. The battle of Colombey, on the 14th of August, partakes for the most part of this character, as it was engaged in only by accident, and the reinforcements came up by degrees, consequently the fight only developed itself with a continually small issue at stake. The employment of the artillery of the Seventh Corps was in this case quite in accordance with the older ideas, according to which the moment for the employment of the artillery mass was deferred until the time when the decision was to take place. As this final act did not take place until after nightfall, these seven batteries remained idle spectators of the fight.

The battle of Gravelotte, on the 18th August, was, on the contrary, a manœuvre battle in the most eminent degree; occupation of the front by the methodical fight of the Seventh, Eighth, and Ninth Corps, assault of the right hostile wing from the flank by the Guard and Twelfth Corps, with the Tenth Corps following as a reserve, prepared by an overwhelming artillery fire, reserves also for the centre and right wing, consisting of the Second and Third Corps.

The introduction did not assume so favourable a form as at Königgratz, as on account of the strategical situation it was not so easy to command the tactical situation so favourably. All the greater art, therefore, was necessary to develop the introductory movements on the day of the battle.

The accomplishment of the tactical designs led to great losses being experienced, as the disposition of the troop leaders was not clearly comprehended, and they could not entirely check the impetuous rush to bring the affair to a decision.

In the battles of Wörth and Vionville, the fronts were first engaged.

The fighting of the Fifth Corps at Wörth, which was at first engaged alone, was, however, carried through entirely according

to the successive manner of the methodical fight, in accordance with its immediate object, which was to prevent the enemy from quitting his position.

The Third Corps at Vionville had gained its object after it had won the heights of Flavigny and Vionville; all that was then necessary was to maintain itself there. The short, offensive attacks on the part of the cavalry, and the arrival of reinforcements from other corps, all had this object principally in view.

If the reinforcements which had arrived by the afternoon had increased to such an extent that they might have pressed forward to bring about a decision, this battle would then have assumed the character of the methodical fight in accordance with that earlier theory which required that for this eventuality, the whole of the force should be on the spot from the very first. The attack of the Brigade Wedel itself partook of the character of that blow which is to wrest the decision; the "calculation" however, even if it was taken into consideration in general, would have been quite illusory as regards the enemy's reserves, which were still at hand.

At Wörth, on the other hand, the success of the Eleventh Corps carried them just at the right time into the right flank of the enemy's centre, and the capture of Elsasshausen secured the union of both corps, viz., the Fifth and Eleventh. Owing to this, the battle of Wörth assumed the character of the manœuvre which was originally to have been carried out on the following day.

We have here, the occupation of the front by the Second Bavarian and the Fifth Corps, with the First Bavarian Corps as the reserve; and the overwhelming attack of the enemy's right wing by the Eleventh Corps, with the Wurtemberg and Baden troops as reserves. The early engagement of the Fifth Corps, and the energy of its attacks, had served the purpose of drawing the hostile reserves upon itself, so that the task of the Eleventh Corps was materially lightened.

This is however necessary in the manœuvre battle. A disposition made previously, having this object in view, could not possibly have set about it in a better way.

The battle of Sedan—the result of the most marvellous strategical manœuvres—was, as regards the decisive points, essentially an artillery battle, so that only a small infantry force was required in order to give the final blow.

It was just the same later on, as regards the Republican levies, whenever the *terrain* in any way enabled artillery to be used. On every occasion where the infantry fight with its successive efforts was predominantly employed, as at Spichern, Fifth Corps at Wörth, Third Corps at Vionville, Eighth and Ninth Corps at Gravelotte, the result was the complete dissolution of the body of troops engaged, divisions as well as corps, and extraordinary losses.

We shall next proceed to point out the manner in which the individual arms were used, as was shown in this campaign.

The Infantry.

THIS was the first campaign in which infantry fought breech-loader against breech-loader.

In the very first battles, the different method of fighting on the part of the infantry who were opposed to one another, evinced itself. The French believed that they must obtain the greatest advantage from the low trajectory and greater range of the chassepot, by firing from a great distance. It is not to be denied that in individual instances they did make an impression therewith, but it was only a transient one. It is certainly not a rational way of making use of a firearm, as hitting is left altogether to mere chance, and shooting at such long ranges only leads to a waste of ammunition. Moreover, when the greatest portion of our strength is squandered at a long distance from our opponent, it is impossible that we can have that amount available which is indispensable when coming to destructive fire-fighting at close quarters; at all events, it will easily lead to careful aiming being dispensed with.

If these faults evince themselves very prominently in the

defence, how much more must it be the case in the attack, as empirically it is very difficult to make soldiers who are firing advance, especially when they cannot see the effect of their fire, and are consequently not induced thereby to throw themselves upon the enemy. To commence firing at the enemy from so great a distance (1500 to 2000 paces) will only result in loss of all superviso ; an advance with the bayonet will never succeed.

It is only the artillery and individual excellent marksmen that should fire at these long ranges.

In the Prussian manner of fighting a system has been established under every circumstance, according to which the fire-fighting of the infantry, even of the skirmishers (and in fact at the word of command only), is only to begin when it is possible to sight the individual man ; on the other hand, strong lines of skirmishers are thrown out, with which a determined attack is made as soon as it is possible to do so. According to the Prussian instructions, the initiative for this is left to the lines of skirmishers, who must themselves start the impulse therefore if a result is to ensue therefrom. It is not however intended to prevent this impulse from being given by beating drums, and by the hurrahs of the company columns which are pressing forward from behind. The skirmishers must push forward in any case in order to divert the fire.

Salvos are quite suitable against hostile artillery positions, and against infantry that has been repulsed, even at considerable distances. It has, however, been proved that they are quite impracticable in infantry fighting at shorter ranges, and when opposed to breech-loaders. In future, skirmish fighting will alone be able to hold its own, also in the defence.

The needle-gun, therefore, can show no results in the year 1870 obtained from mass and rapid firing similar to those obtained in the campaign of 1866. Notwithstanding, the instructions with respect to the advance of the supports and special reserves in close order, and even as to the delivery of salvos and rapid independent firing, were still in force ; because perhaps they might

be made available where the *terrain* was favourable. This might also be the case in the event of an incautious advance on the part of the enemy, or where the intellectual and moral superiority were very great. In open, even ground, much greater elasticity was to be allowed in following them.

The skirmish fight itself appears capable of being perfected to a much greater extent.

Advancing by bounds, and then throwing themselves on the ground, is not satisfactory for the commander, who is responsible for their direction; the reinforcing of the lines of skirmishers does not carry them on to the front. Where it is necessary to omit operations against the flanks, or in outflanking movements, which are always the most effectual, it will be necessary to cause fresh lines of skirmishers to pass over those in front, but it will be necessary to rally them, in order to re-form them anew into a line in rear of the rest. This is certainly to be opposed to such a proceeding, viz., that experience shows that the energy of infantry when they have been once engaged in a close fire fight, becomes so completely exhausted, that one cannot count on any further employment of them. Moreover in this proceeding, which constitutes the rule in cavalry combats—though the conditions may be more favourable, especially when the actual fighting is of shorter duration—lies the only possibility of carrying on a mass fight of infantry, and gaining ground therewith.

At an interval of 400 paces between the divisions the hinder divisions are in every case to be kept together in small masses, the mass fight of the infantry is consequently in general still possible, especially when the artillery on their side has succeeded in silencing that of the enemy, and also in weakening the infantry.

Let it be supposed that the assailant's first line has been brought to a standstill, and is deployed into dense lines of skirmishers for the purpose of fire fighting, without any longer possessing the conductibility and the power to make a forward attack, the second line remains advancing, forms company columns, passes

through the actual first line with them, preceded by its line of skirmishers always advancing, and advances to storm as soon as possible, followed by the third line, which, if circumstances require, would on its part pass in front of the second line. The first line rallies itself meantime behind the third line and follows it. This was, to all intent and purpose, what took place at the storming of the redoubts of Düppel.

We have an analogy to this manner of fighting in the tactics of the time of the knights. Here also, the fighting was carried on in three lines, each constituted of several single bodies of knights in close formation. The result of the shock of the first line was usually to break it up into a number of single combats, at all events where two bodies were mixed together, or where one broke through the other. Under any circumstances, exhaustion soon set in, so that the foremost line retired from the battlefield to the wagon-fortification, where they replaced the splintered lances, broken swords, dead horses, and parts of their equipment which had been lost, and then formed themselves anew behind the third line. At Tannenberg, in 1410, the first line of the Poles, which had been routed, and had re-formed under cover of the wagon-fortification, decided the battle in this manner. If ever an infantry is suited for this manner of rally-fighting as rear division, it is certainly the German infantry. The greatest evil connected therewith will always be the great loss of officers, for in them lies, beyond everything else, the whole nerve of infantry fighting.

In the methodical fight of the infantry, where it depends much less upon mass fighting, a thorough preparation by means of skirmish fighting must take place. But here also "the advance, the advance" (*das stete forwärts*) must be the "motor." If it is only necessary to retain him in his position, the establishment of lines of skirmishers at long range will be sufficient; but one must be always ready to make a forward movement, should the enemy's strength become weakened. Should he assume the offensive, why then let him come on.

The most surprising progress which infantry has made by means of the breech-loader, consists in the independence which it has gained when opposed to cavalry. With the rifle always ready to be discharged, the infantry is no longer defenceless for a moment, and the smallest division, no matter in what formation, has become capable of withstanding it. I have already indicated how originally the small-arm has influenced the fighting formation of infantry, and that with its perfection continually going on, the considerations as regards cavalry with respect to formation of infantry have gradually disappeared.

By means of breech-loaders we have arrived at that stage that no consideration need any longer be paid by infantry to cavalry.

The Artillery.

OWING to the breech-loading rifle, artillery has become of greater importance, because the commanding general who directs the battle, finds in it the principal point of support with which to counteract the effects of the loose nature of the infantry fighting of the present time. It is the stable element in the fighting of to-day.

Smooth-bored ordnance would certainly be no longer suited for this purpose, as its range is not much greater than that of the rifle, and its effect cannot hinder the approach of hostile infantry to a distance where its weapon will commence to take effect. The effective sphere of case-shot, and even of the efficacious shrapnel-fire of smooth-bored guns, falls short of that where we may depend upon an effect being obtained from rifles. They have therefore become unnecessary. There is no doubt but that infantry is very loath to forego the co-operation of artillery at these short ranges; it found therein at the time of smooth-bored guns, a material support when fighting at short distances, without doubt, on account of its moral effect, and the task of the officer responsible for the guidance of the fight was considerably facilitated thereby, as now he is obliged to leave the fighting at short distance pretty well to itself.

The general conducting the battle is consequently now all the more enjoined to make as much use as possible of the energetic effect of rifled guns, by employing them at long ranges *en masse*. This is by no means intended to deter them from advancing to closer range when the moment of decision arrives, as the effect of artillery increases, the nearer it approaches. The explosive effect of the projectiles, moreover, allows of the co-operation of artillery when engaged at comparatively short ranges, as well as at longer distances.

The advantages of rifled guns over smooth-bored are not merely confined to the greater range, the greater accuracy, and the more energetic action of the projectiles; they are better adapted than howitzers for firing at troops which are protected by the *terrain*, and at spaces of ground hidden from view, and in this respect they have supplied a most material tactical want. At the same time they have lost none of their mobility, and the arm has gained in simplicity as regards the various natures of its guns. The increased effect of its fire allows, moreover, of the fire being effectually concentrated on one given point, for not only those batteries which are in proximity to, but also those which are farther off from the common object which is to be fired at, can direct their fire upon it.

Although this property tells to the advantage of the first line of the defence, and greatly increases the difficulty of an attack upon the centre of the position, on the other hand there lies therein a most important offensive element, because, by means of this concentration of fire, the capability of resistance of any one point can be completely broken, and, under certain circumstances, will enable the attack (*Stoss*) to be dispensed with.

Rifled guns have also conferred considerable advantage upon the methodical fight. If it is based upon the plan of fighting by successive movements, and on having only a small stake at issue at one time, it is not by any means intended that the artillery should be debarred from taking part in it in considerable numbers, because the artillery fight depends upon quite other principles than

does the infantry fight, and especially demands that its powers should be exerted simultaneously.

Smooth-bored guns, owing to their limited amount of range, were but little suited to support the skirmish fighting of infantry. They filled up the intervals between the *foci* of the battle very well wherever the *terrain* allowed this to be done; their task, however, was more to ward off attacks than to assume the offensive themselves, and the space for them to take up a position in was generally very circumscribed. The long range at which rifled guns produced an effect, and the explosive effect of the shells, allows them, on the contrary, to participate offensively, and with effect, in the infantry fight at closer distances, and the space behind the lines of skirmishers is at all events available. The circumstance that the methodical fight requires that intact reserves should be retained for the final decision, does not hinder the artillery from taking part in the fight from the very first, as one of its most material advantages consists in this fact, that the losses which it suffers, when not too severe, diminish their fighting capability but little. We see, therefore, in the campaign of 1870-71, it was immaterial whether the fight was carried on successively, or by mass attacks, from the very first the artillery force was completely developed. We may say that it was not the consideration as to whether a reserve artillery should be kept back, but the space available, which entirely decided whether the whole force of the artillery was to be placed in position from the beginning. This great advantage resulted therefrom, viz., that the enemy's artillery was soon placed *hors de combat*, whereas the French method of proceeding was in accordance with quite other maxims. It was especially advantageous to the German side that a central reserve artillery was never formed.

It resulted of itself from this employment of artillery, that the latter took advantage of the ground according to the manner in which the guns could most advantageously take up their position on it, without any consideration as regards the advance of the in-

fantry later on. As the tactics of the present no longer look to the geometrical conditions of the first advance of armies, and regard the *terrain* entirely with respect to the cover which it may afford, the artillery found it much easier to place itself in position. There is no doubt that men who are capable of handling troops (*Truppenführer*) are required at the head of the artillery divisions. It will be seldom that the divisional or corps artillery will receive any other command than "to advance." To find the given place at the very first advance, consequently to be able to comprehend the whole situation independently, and to adopt the right plan of action in accordance therewith, was entirely the affair of the artillery commanders. It was frequently the case on these occasions that the artillery had to dispense for some time with all protection from the other arms, or as at Amiens when the corps artillery of the first *corps d'armée* carried on an independent fight.*

It follows from what we have previously said with regard to the character of the battles of the campaign of 1870, that it was only in the battles of Wörth, Gravelotte, Noisseville (second day), and Sedan, that the artillery appears to have carried out the demoralisation act of the attack independently.

Its independent employment from a defensive point of view, for the purpose of warding off the enemy's attacks, instances itself in an extraordinary manner in the battles of Vionville, and Noisseville (first day). At Spichern, Colombey, and in the methodical fights, having for their object the preventing the enemy from getting away—along the front of the above mentioned battles, it carried the fight through, in common with the infantry and in their service. Wörth will serve to give a clearer illustration, as the methodical fight of the Fifth Corps, supported by the whole of its artillery, and the decisive co-operation (*eingreifen*) of the artillery of the Eleventh Corps, are instances of great interest

* *Vide* Lieut.-Col. C. Brackenburg's "Lecture on the Tactical Power of Modern Field Artillery," in No. 86, *Journal of the R. A. S. Institution*, for other similar instances during the campaign of 1870–71.

as regards the employment of this arm. The determination to give battle emanated, as it is known, about 9 A.M. from the General commanding the Fifth *corps d'armée*, respectively from his chief of the staff, and was caused by the vigorous fire which had developed itself on the right from the Second Bavarian Corps, and on the left from the Eleventh Corps, owing to a slight engagement of the advanced guard of the Fifth Corps. Although the extension of the battle on both wings could not well be overlooked, taking everything into consideration, it appeared necessary that the enemy's centre should be held fast, so that those corps which were in the vicinity might be protected from an attack by superior forces. This appeared necessary, as the Sauer, with its heights rising sheer up, and commanding the whole of this side of the valley, could have been defended by the enemy for a considerable time with a small force. Owing to the fact that the ground hid them, it was not possible to ascertain their strength. The enemy might have weakened himself here most considerably. The Fifth Corps, which was bivouacked at Prenschdorf, was therefore alarmed, and pushed forward against Wörth and the Sauer. The whole of the artillery of the corps, eighty-four guns, was sent forward, and deployed into one unbroken line (about 10 A.M.) at a distance of 1000 paces from this side of the Sauer, and parallel to it.

Five batteries of the corps artillery and the Third Division of the field artillery (Tenth Division) were posted on both sides of the high-road, and on the left wing the four batteries of the Ninth Division, of which the two light batteries were in position to the north of the Spachbach, and at some little distance from the others.

This was evidently the most suitable means by which to prevent the enemy from detaching any part of his force against the flanks of our position, or in the event of his already having done so, it was certain to make him so anxious about his centre, that it would be necessary to recall it immediately. Other reasons also called for it. It was impossible to succeed in arresting the

enemy by a mere demonstration from the side of the Sauer. It was essential that the means of crossing (*Deboucheen*) that river should come into our power, also that the heads of the columns should be established on that side, in order that they might at once fall upon the enemy, should he first weaken his centre, or commence to retreat. The only way in which this was possible, owing to the ground being so difficult, was by making the most energetic use of the artillery. Besides, there was no reason why the batteries should be kept in reserve, as it was hardly probable that the enemy would make an offensive movement across the Sauer with his centre; moreover, the artillery was quite prepared to meet it. It was of far more importance, by developing a superior artillery, to silence that of the enemy as soon as possible, and to support the infantry fight with as much effect as was capable.

It would have been impossible to have accomplished this, if the batteries had been brought into action successively.

After the enemy's artillery had been silenced, two regiments of the Tenth Division crossed the Sauer about eleven o'clock, at different points, and were at once engaged in a violent combat.

At this moment* an order arrived from Headquarters to discontinue the fight. It would have been impossible to do this under the circumstances as they then were, without suffering great loss. General von Kirchbach consequently took upon himself to continue the fight, sent word to say that he had done so, and caused his intention to be communicated to the Generals commanding the Second Bavarian and the Eleventh Corps, that they might endeavour to push forward, assuming the offensive. As the Second Bavarian Corps had already discontinued the fight, and only a small proportion of the Eleventh Corps had arrived in position at Gunstett, the Fifth Corps were placed in a bad predicament, from which they could only be released by the continual arrival of fresh forces.

* It was afterwards shown that it was really only in the Second Bavarian Corps that this occurred.

The artillery of the Fifth Corps had, during the whole of this time kept up an uninterrupted fire, partly in order to subdue fresh hostile batteries which from time to time again emerged, and partly against the enemy's reserves, in order to check individual advances on their part from the side of Elsasshausen. Our infantry had not yet succeeded in gaining a position on the other side of Wörth, which would have allowed of the batteries being brought over. Moreover, the bridge of Wörth was broken down, and had not yet been restored.

At Gunstett the battle had again become animated. Dumesnil's Division of the Seventh French Corps had crossed over here about ten o'clock, in order to attack, found the Twenty-first Infantry Division ready to receive them, and was repeatedly driven back by the latter. The Eleventh Corps, which had remained in bivouac at Sulz and had intended on this day only to make a short march, took advantage of these fights to concentrate itself at Gunstett, and to bring the whole of its artillery into action towards mid-day.

The four divisional batteries of the Twenty-second Infantry Division took up their position near, and between those of the Twenty-first Infantry Division which were already in position to the north of Gunstett. The Corps Artillery did the same, with the exception of the Fifth and Sixth Heavy Batteries, which were obliged to remain behind owing to their being insufficient room for them.

When the order to advance and assume the offensive was received from Headquarters, about half-past twelve, the corps crossed the Sauer about one o'clock: the Forty-second Infantry Brigade to the south of Spachbach; the other parts of the *corps d'armée* by the bridges of Gunstett.

Favoured by the admirable position which the artillery had taken up to the north of Gunstett, it was soon able to rout Dumesnil's Division, which had been much shattered by its repeated attacks on Gunstett, and to penetrate into the Niederwald.

The batteries immediately followed; the First Horse Battery (Sylvius) ascended the heights to the south of Wörth (*Galgenhügell*) which had meanwhile been stormed by the Fiftieth, Forty-seventh, and King's Grenadier Regiments, and now put a stop to the skirmish fighting which had been wavering hither and thither for some time. A combined attack of portions of the Fifth and Eleventh Corps drove the enemy out of Elsasshausen, which had been already set on fire by the batteries of the Fifth Corps.

It might have been about 2.30 P.M. when one of the batteries of the Eleventh Corps established itself to the east of Elsasshausen.

This was the signal for the batteries of the Fifth Corps, which were on the south of the Wörth-Sulz road, to limber up, and to cross the Sauer. Although the bridge at Wörth had been very badly restored, still it was possible, with many interruptions, for them to cross over it, and to strike into the road towards Elsasshausen. Meanwhile, the remainder of the artillery of the Eleventh Corps had reached this place, and had taken up a position east and west of Elsasshausen, fronting towards Froschweiler. Three batteries stood west of the village. A final attempt on the part of the French to recapture Elsasshausen completely failed, owing to the fire of these batteries; the same fate attended the repeated attacks of the hostile cavalry. Part of the batteries of the Fifth Corps doubled the number of batteries which had taken up a position to the east of Elsasshausen, and partly established themselves on the plateau to the west of Elsasshausen (the Fifth Heavy and Sixth Light Batteries), so that nearly 100 guns commanded the plateau of Froschweiler, and not only overcame every opposition, but hindered the flight of the enemy upon the high-road towards Reichshofen. This is the only explanation for the great number of prisoners which were able to be made in Froschweiler.

No further opposition was made to the advance of the infantry against Froschweiler. The Third and Fourth Heavy Batteries

of the Corps-Artillery of the Fifth *Corps d'Armée*, who took part in this advance, did not fire another shot.

On the other hand, simultaneously with the attack of the Eleventh Corps, severe fighting on the part of the Bavarians took place to the north and east of Froschweiler, which effected the decision only in so far, as it prevented the forces opposed to them from leaving their position.

We find therefore, as the various circumstances of the fight became gradually developed, after the introductory fights of the Fifth Corps—which filled up the time until one o'clock—the energetic attack of the Eleventh Corps against the enemy's right wing was most efficiently prepared by the artillery. After this had been overthrown, the combined attack upon the right flank of the enemy's centre, which was now quite bare, by the Fifth and Eleventh Corps, together with the establishment of a great battery on both sides of Elsasshausen, constituted the second act. The stubborn infantry fight, which the Fifth Corps supported by the whole of its artillery had had to sustain against the hostile centre, made the success of the Eleventh Corps possible; owing to the fact that the former had drawn the enemy's reserves upon itself.

This is exactly what can be counted upon being attained by means of the manœuvre battle. In a similar manner, the energetic activity which brought the Seventh, Eighth, and Ninth Corps into position along the front in the battle of Gravelotte, not only succeeded in holding the forces opposed to them in their position, but also kept the enemy's reserves away from St. Privat, the point of attack. The attack against the enemy's right wing combined with a flank manœuvre, was able in consequence to follow with overwhelming forces.

The artillery was here employed in the same manner as at Wörth. The whole force, as far as the *terrain* permitted, took part in the methodical fight along the front, and an overwhelming mass of artillery was brought to bear against the point to be assaulted. It is certainly to be wished that the corps artillery

of the Tenth Corps which was in reserve, had been brought to the front at an earlier period, in order that the act of demoralisation might have been carried out by the artillery earlier and as thoroughly as possible.

A second act of demoralisation was not necessary here, as the Fourth French Corps after the flight of the Sixth, vacated the position of Amanvilliers of their own accord, and darkness had completly set in when the French Guard Corps arrived here. The second day of Noisseville (1st September) shows us the extraordinary effect of an encompassing artillery attack. It would appear at the first glance, as if rifled guns, owing to the bursting effect of their shells, could dispense with the encompassing movement, the importance of which, in comparison with what it was in regard to smooth-bored guns, has at least diminished. There is no doubt but that the ricochet effect of solid shot was much greater against the flank than against the front. But as the splinters of shells fly forwards much more than they do laterally, their effect upon a flank is simply murderous. The batteries of the Corps Artillery and of the Fifth Infantry Brigade, which had been engaged on the 1st of September for hours firing against the enemy's front, had not succeeded in silencing the French artillery which was on both sides of Noisseville. The two light batteries of the Hoyna Brigade, which appeared on the flank of the French batteries, immediately succeeded in doing this. Their performance later on was also very remarkable.

"After the hostile batteries had disappeared," so we find it in the "Militär Wochenblatt," 1872, page 184, "he (General Woyna) caused the artillery to open fire upon Flanville, as a skirmish fight had been carried on for some time against this village, which was occupied by the enemy in force, without any result. The two batteries rained such a shower of well-directed shells upon the village that the enemy was obliged to quit it (as it was in flames), unable to withstand this destructive fire. It at once fell into the hands of the companies of the Fifty-third Regiment, who rushed forward to carry it by assault."

And further with regard to Coincy: "After Flanville had thus fallen, and the enemy had retreated from this part of the field, Coincy was the next point which the enemy occupied. A company (Fourth Company, Regiment No. 45) was observed to be already engaged on the heights to the north-west of Marsilly, in a fire fight with the former place, which soon ended with the retreat of this detachment.

"General von Woyna followed the same maxim here, as he had done at Flanville, viz., to cause the artillery to prepare the infantry fight sufficiently, and he next directed the fire of his guns upon the place. The two batteries succeeded by the effect of their shells, every one of which told, in demoralising the enemy to such an extent that, influenced by the terror of these shells, they rushed out of the village. But the Prussian shells smote the retreating masses with horrible accuracy, and drove them back upon Colombey and La Planchette. There was no longer any necessity for an infantry attack here. Upon this, the brigade was ordered to move off to support the Memerty Brigade, and was about to march off by its right" (p. 185), when the enemy again advanced with strong columns from Colombey and La Planchette. The brigade was compelled to halt, and the batteries encountered the new offensive so successfully that it never even got so far as to be able to open fire with its infantry."

The brigade lost in this fight one man killed, nineteen men wounded, three missing. The report concludes, "As the officer who conducted the fight never undertook any attack without preparing the way for it most thoroughly by means of the combined batteries, the brigade was spared from heavy sacrifices in the influential activity which it displayed."

When we compare this result with the fight of Noisseville on the same day, which entailed great loss on our troops, it appears as if the result of the preparation by the artillery had not been sufficient. The opponent we had to encounter here, was predominantly the enemy's artillery. The first thing necessary was to compel it to retreat.

The successive employment of forces has its part to play also in the artillery fight. In this case it is the successive concentration of fire upon the different objects which must follow one another according to their importance. The efficacy of artillery demands above everything "concentration." Dispersion of the batteries makes them just as inefficient as when their fire is dispersed.

At the time when the methodical fight was the only one known to our text-books, and infantry took part in the battle from the very beginning, the foremost rule laid down for the manner in which artillery was to be used, was, that it should direct its fire against the enemy's troops alone, and quite ignore the hostile artillery. This is quite altered as regards rifled guns. Here, even in the methodical fight, an artillery fight takes place first of all.

In the defence, the old rule still holds good under certain conditions, particularly when the defender's artillery does not wish to engage with that of the assailant, and withdraws itself as much as possible from the effect of the latter, in order to be efficient when the enemy's infantry advances to the attack. Should, however, the defender's artillery be capable of engaging that of the assailant, either on account of the disparity as regards the number of guns not being too great, or else owing to skilful handling on his part, he succeeds in counterbalancing the enemy's superiority—then it is positively ordered to keep up an artillery fight, as the assailant will not at first expose his infantry, and by this means the enemy's fire will be diverted from the defender's infantry. By this means it will be best prepared to receive the enemy's advancing infantry. The deeds of the Prussian artillery in the battle of Vionville, and on the first day of Noisseville, constitute in this respect "epochs" (*Epoche machend*).

The assailant's artillery must make that of the enemy the immediate object of its fire under all circumstances, as the entire effect it may produce on the hostile infantry, which, moreover,

will be as much as possible under cover, is generally illusory, as they cannot be driven away by mere force. The shock must be added thereto, and the enemy's artillery will suffice to repulse it.

The mere concentration of artillery against a part of the enemy's position is not sufficient for the attack, its fire must be directed as though it were one unit, and must be concentrated upon certain points. The choice of these points depends upon the fighting situation ; the most important points, and these will almost always be the nearest, must serve as the first to be aimed at. Owing to the materially different character which an artillery fight has, accordingly as it has either to prepare an infantry attack *en masse*, or else to serve in the methodical fight for the purpose of keeping the enemy in his position, the range as well as the rapidity of the fire will have to differ considerably.

There is no doubt that at the battle of Gravelotte, the batteries of the Ninth Corps were too near; whereby not only the artillery, but also the infantry, which had to protect it, suffered great loss. In order to support a stationary fight (*hinhalttenden gefecht*), the artillery action is to assume the character of a simple cannonade, and it is only to hold itself prepared to advance immediately in order to attack at shorter range, should the enemy weaken himself. But where it is a question of completing an act of demoralisation, in order to prepare an infantry attack *en masse*, then shorter range, quicker fire, and change of position so as to accompany the infantry fight will be necessary. The ranges will generally be determined by the *terrain*, and this was almost always the case in the battles of 1870, where one commanding ground stood opposite to another, and where on account of the construction of our carriages a limit was set to the distance at which our guns could take up a position from the summit of the reverse slope.

A point is soon come to when we cannot touch the enemy, even at moderate distances, even where a comparatively level position has with great trouble been made for the guns. Ranges of from 2000 to 2400 yards are the farthest which artillery should

make use of, but excellent effects are quite capable of being obtained at these distances.*

Sedan is extremely instructive in all these respects.

At Sedan the very superior German forces were brought into action in a manner which was most favourable for the artillery, as the enemy were surrounded on all sides. The decision was actually brought about directly the artillery was placed in position. The artillery combat when concentrated and encompassing in this manner, shows that it is capable of making every attempt on the part of the enemy to establish his artillery impossible. It can also repulse any attempt of the enemy's infantry to break his way through by means of mass attacks, at distances of from 1000 to 2400 yards in open ground, keep large spaces of *terrain* which are sheltered or hidden by rising ground, under fire, and is able to fill up any large gaps in its order of battle almost without any protection from the other arms. It is only, however, when artillery is employed similarly *en masse*, that it is able to obtain similar results by its fighting powers. They served here specially to demonstrate in the grandest manner what the effect of artillery is, and to stir up confidence in it. Its influence shows itself in the later battles, as the utmost use was made of it.

It would be too much to deduce from this that artillery can dispense with the protection of the other arms. No artillerist who knows the effect of his arm can be of opinion that even a respectable line of artillery can withstand a good combined cavalry attack. One of the most important duties of cavalry in battle will be to protect its own artillery mass, and eventually to hold itself prepared to fall upon the enemy's line of artillery, when the fighting object requires that this should be done. Owing to

* Col. Brackenburg in his lecture on Artillery, alluded to at page 137, gives an example of the effect at Okehampton, of a battery, firing at 4000 yards, against a small cavalry column (represented by targets), 53 yards deep, where 36 rounds gave a result of 542 hits. At 3000 yards against a body of infantry 400 strong, 18 shrapnel with time fuses disabled 109 men.—*Tr.*

the great loss which is inseparable from such an attack, it should not be done alone, but must serve some great object and be connected with other operations.

The Cavalry.

RIFLED firearms have taught cavalry to keep at a respectful distance from the fire fighting, but this is by no means to exclude them from taking part in the battle. Leaving aside the divisional cavalry, which will always find opportunities for obtaining small results, whenever the *terrain* affords them sufficient cover to remain near the infantry, the dependence of artillery will give cavalry the possibility of effecting a change in the circumstances of the fight which may be fraught with the most important results.

Such a case can happen when it is intended to pass from the defensive to the offensive, but powerful batteries prevent this being done. It may also occur when on the offensive, where the defender has succeeded in developing a strong line of artillery on the very point which it is intended to attack, and an open *terrain* prevents the infantry from advancing. Or another instance, when in order to secure a point of the enemy's position which has been won from counter attacks, the assailant's cavalry throws itself upon the enemy's reserves, so that its own infantry and artillery may be given time to establish themselves on the defensive.

We have seen that in modern battles this momentum plays an important *rôle*.

In all these instances there was no prospect of triumphs such as those which cavalry gained in former days, but the arm serves here for the most important fighting purposes, as was instanced at Vionville, where it stopped the attack of the enemy's very superior forces, and by doing so gained time for reinforcements to arrive on the scene of action. Here it served as a makeshift, whereas in the instances mentioned before it is called upon to

perform a duty which can be carried out by no other arm. For were this latter to be held up as a standing example, it would lead to the most erroneous ideas as to how cavalry should be employed.

It is evident from what came to light as regards the energy with which the battles of the last campaign were conducted on the German side, that we shall not shrink from using such means when they are called for, and cavalry will joyfully comply with an order which will not in the slightest degree diminish their old renown for deciding the battle.

Certainly it is not every cavalry that could perform feats of this kind.

Besides the spirit of chivalry which is here a *sine quâ non*, the physical training of man and horse required to enable them to go at a rapid pace for a length of time—which, owing to their being situated in the reserve, was necessary, to enable them to get to the front to deliver their blow—demands conditions and a carefulness in the peace training, which are only possible in the German cavalry. It would be a question of traversing a distance of from 2400 to 3200 yards at a rapid pace, in strong divisions at close order, and still to have wind enough to meet a hostile attack.

The tactics of the present day, however, show that such strenuous exertions may have to be made, and the way is being cleared to enable them to be made. It is known that the most distinguished cavalry generals have directed their efforts to bring this about.

No arm is more necessary to the reserve than cavalry. The three-line formation has been an established custom, dating from very long time.

The first line requires one-half of the whole force, so that a cavalry division of six regiments must have three in the first line, two in the second, and one in the third line. The first line must send out an advanced line (*vortreffen*), for which each regiment will detach a squadron. This is intended to swarm down in

sudden attacks upon artillery (*schwärmattaque*), and must proceed to this as soon as possible. The distance between the lines, including the front line of all, is 320 yards. The approach is made in separate columns of squadrons, the attack itself is made in line.

The *terrain* will oppose great difficulties to the advance, as open ground of this extent will seldom be met with. Practice is necessary to overcome these difficulties. It will be very advantageous if the cavalry covering the enemy's artillery arrange their counter attack, so that the assaulting cavalry shall receive the whole fire of the artillery. This is doubly important. Either the attack upon the artillery succeeds, in which case the assaulting cavalry will find itself in complete disorder without having time to do the artillery material harm, or else it does not succeed. In this case the fire of the artillery has been sufficient to repulse the attack, and will occasion it great loss during its retreat, more than a pursuing cavalry could do. Besides, the latter would mask the fire of the artillery for some time, and great disadvantage would ensue. The actual object of this attack was to mask the artillery fire, in order to favour the operations of the infantry, which were combined with the attack.

Where cavalry is called upon to throw itself upon the enemy's reserves, after the infantry has succeeded in breaking through the first line, it will not be able to avoid attacking infantry. All that is required is that the latter should be prevented from leaving their position. There is no reason, therefore, why the attack should be frustrated: the principal mass of the cavalry will be able to keep itself clear from the effect of infantry fire. What was so gloriously improvised at Vionville, requires consideration and practice, in order that the losses which take place may be as small as possible. Cases of this kind may frequently occur.

The best employment of the Austrian Cavalry Reserve at Königgratz would undoubtedly have been to have launched it at the detachments of the Second Army, as they came up singly. By this means they would have given time to the infantry reserve

to become developed. The possibility of such an attack being made should have induced the Prussians to provide for its being met, by pushing forward the Cavalry Corps beyond Benatek as soon as the First Guard Division had won Maslowed.

The great extension of battlefields for armies of 200,000 men, the time necessary for sending instructions to the right places, the nature of these instructions—which often fail to make the impression which they ought to, frequently the want of orders, or their arrival too late, owing perhaps to the disadvantageous position of the General Commanding-in-Chief; all this presents great difficulties in this respect to those who are responsible for the chief conduct.

No less difficult is the task of the cavalry commander, who, after having gone a couple of miles in order that he may grasp the new conditions of the battle, has to bring his cavalry mass to the right spot, develop it in the right manner, and then to attack with it.

We shall here conclude our remarks upon cavalry, as it is only their tactical movements that we have in view. Their employment in operations, as well as the question of their armament, is foreign to our task.

The Terrain.

RIFLED firearms have greatly increased the importance of the *terrain* in this double respect, viz., as regards the protection which it affords against the energetic effect of the firearms of the present day, and the manner in which it favours the use of our own firearms.

The considerations which the terrain imposes in this respect are so imperious both for the attack and the defence, that they have really become decisive.

This consists as much in the strength which the defence has gained thereby, for it can select the most advantageous *terrain* for its operations and for its protection, as in the power which it

confers on the assailant of choosing his point of attack. The *terrain* in front of the latter must allow of his approaching, as well as of his being able to place a superior number of guns to those of the defender in an advantageous position. In this respect a principal consideration for the defender in the choice of his position must be, to exclude the assailant from the use of good artillery positions, and to prevent him from approaching under cover. He increases thereby the effect of his own firearms, and compels the assailant to make a predominant use of his infantry which is advantageous under all circumstances. Declivities, the slopes of which are flat and pretty steep, answer these conditions best, as they favour the effect of one's own fire and limit that of the enemy, as the assailant can find no nearer position for his artillery, and the value of distant positions is very limited. The defender will also have a field especially favourable for the delivery of short offensive blows, while the assailant is weakened in the effect of his fire and during his onset. Besides this, the height of the situation will enable the defender to have a clear supervision of the enemy's attacking movements, which in the plain, owing to smoke and swarms of skirmishers, would be almost impossible. As the considerations which favour the effect the defender wishes to produce, will often clash with the cover, the fortification of the *terrain* by artificial means must often ensue. These considerations, however, are not to be the sole ones, when the choice of a position has to be made. It will often be necessary to content oneself with a bad position and overcome its defects by the skilful erection of fortifications.

To have a rapid perception of the advantages or defects of the *terrain*, is one of the most important attributes of a general or other commander, and it is especially in *rencontre* fights that its value will make itself apparent.

Attack and Defence.

THE old controversy, which is the superior tactical form—the attack or the defence?—has not been practically decided by the

latest wars. If the defence has gained in power by the use of rifled firearms, owing to the view that their advantages must be utilised to the utmost, a constraint of such a nature is imposed upon operations, that, through it, initiative in acting becomes lost. It will be advantageous only to allow the tactical defence to be made use of where circumstances imperatively call for it, where one is actually, so to speak, chained to the soil.

Offensive intentions must, however, never be lost sight of in a case of this kind. The solution of this controversy lies far less in the productiveness of the effect of firearms, than in the moral power which the initiative confers.

Moreover, whoever is directed to seek for a tactical decision, must not delay in choosing the attack, as loss of time often involves much greater disadvantages than a momentary check, which probably the enemy does not in the least know how to profit by. The energy of will necessary for carrying on war loses too much by carefully weighing the chances on both sides, and frequently leads to indecision, whilst a check incurred by too great an amount of self-confidence often increases this energy. Trusting in luck, is half the battle in war.

The energetic effect of rifled firearms has led to this conclusion being formed from the results of the last war, that the value of the active defence has diminished, and that when occupying a position it is very important that the first line should be made as strong as possible. Even in this case too much stress is laid on the effect of firearms. The fire effect only constitutes one force when these conditions are being carefully considered. Certainly it can generally demoralise, but it cannot decide; much more, the shock must always be added to it. The active defence presents herewith the most favourable combination of fire and shock, on great as well as on small occasions. Whoever scatters his forces too much for fire-fighting, will not have sufficient left to deliver the blow with. Besides, it is improbable that the defender can know previously in what direction the enemy will concentrate his forces.

The proportion between the strength of the main reserve and of the force which is to occupy the front line of a position, must therefore remain the same as heretofore; it will, however, be advisable to keep back only the smaller portion of those troops which are intended to occupy the front line, in order to form a second line, or a special reserve. It is the same when defensive posts are to be occupied. Here also the principal portion remains in reserve in order that it may act offensively, consideration must then be paid to the outskirts, which should be strongly occupied. If the front line of a position is too strongly occupied, it will lead necessarily to passive defence, as the reserves will then only suffice to feed the line of fire, but not for an offensive blow.

But the active defensive must not entertain the idea of driving the enemy out of the position when he has once got into it, but must fall upon him before he gets there, consequently after he has become weakened by the fire kept up from the position. It is just in this that the favourable combination of fire and attack consists. Should the enemy be permitted to break through the first line, not only will those troops which have been beaten relax their efforts, but those which are posted immediately on one side of them must retreat, as they are outflanked. The reserves cannot then at once advance to the attack, as they could have done if they had fallen upon the enemy in front of the position, where he was still influenced by the effect of the fire; but they must on their side first produce an effect with their fire. This requires above everything time, which the opponent will profit by, to allow reinforcements to come up. Such blows which are not delivered until the enemy has made an impression on the situation, are only counter-strokes wrung out from the defender, but which do not emanate from his free initiative.

The active defence has, in respect to former times, gained, for this reason, viz., that, in the manner of fighting of the present day, the attack in long scattered lines lays itself particularly open to flank attacks. It ensues from these conditions that the active

defence must seek out favourable points of ground in the *terrain* which is in front of it, which must be occupied and stubbornly defended. The blows which it delivers will then not only find favourable *points d'appui*, the fire effect from which will have already weakened the enemy, they will also present opportunities for the formation of offensive flanks, and hinder the enemy from penetrating into the main position of the defender.

They should certainly not be isolated, nor lie beyond the zone of the artillery fire of the main position, otherwise they could be easily surrounded.

It is of the greatest importance to have a right comprehension of the tactical importance of such points with respect to the position, in order that they may be suitably protected.

When the assailant has once got possession of them, and they are protected by his artillery, which has meantime hastened up, they become extremely dangerous.

The cemetery hill to the south of Wörth became in that battle, in this respect, of the greatest importance as regards the issue of the battle, as by its capture the Fifth Corps was enabled to assert its footing upon the plateau, and the Eleventh Corps, which arrived shortly afterwards, found here a *point d'appui* all ready for it. The capture of the height 326 yards south-east of Flavigny in the battle of Vionville, made it possible for the batteries of the Third Corps to take up an advantageous position. Had the French grasped its importance, it would have been still quite impossible for them to have regained possession of it.

Servigny, on the first day of the battle of Noisseville, belongs to this category, although the fault consists more in the fact that the Prussians did not include it from the very first in the main position. Where positions are situated on high ridges which are bare, the farther slope, not the bottom, should be chosen for these advanced posts, as, in the latter case, it is difficult to defend them.

Insecure flanks must be protected by reserves retained for this purpose, who, in case of any attempt being made to turn the

flanks, must counteract it by themselves encompassing the attacking party. The French made no attempt to do this either at Wörth or at Gravelotte. Such positions cannot be held without an active defence; as owing to rifled firearms the effect of encompassing movements is quite overpowering.

The strength which rifled firearms confers on the defence, demands on the part of the attack that recourse be had to every means which can be obtained by art. The one which all ages have shown as the most certain, is to hurl superior forces upon one point of the enemy's position, and by this means to partially overcome him.

We have already seen that in order to obtain the most advantageous result, this point must either be a flank or a wing of the enemy. A point in the centre, owing to the flanking effect which the defender's artillery can produce, as it would be posted sideways to the point attacked, should be chosen only when the circumstances are extremely favourable, for instance, when it is exposed to being surrounded itself, as Solferino, Chlum, or where the enemy, as at Orleans, is posted in such an extended position and is without reserves, when it will be easy to break through the centre. It will be very advantageous when all arms can co-operate against the point of attack, for the concentration of forces, and their joint effect, will be greatly simplified thereby.

Concentration against one point presupposes that the enemy is held fast in the other points, in order that he may be prevented from reinforcing the point of attack. Where it is possible, the attacks on these points must be made beforehand, in order to withdraw the defender's forces from the point of attack which has been chosen, or at least to keep the enemy's reserves away from it.

The battles of Königgratz, Wörth, and Gravelotte will remain as standing examples in this respect. Although it was partly only by chance that they assumed the form of manœuvre battles, they, as well as the battle of Solferino, are none the less interesting for the student.

Method demands infantry attacks *en masse* on the part of the assailant, divided, according to the method of fighting of the present day, into lines of skirmishers following one another, and prepared by an act of demoralisation on the part of the artillery. Cavalry will also be required under certain conditions, in order that points which have been won may be firmly held, for they must throw themselves upon the hostile reserves. This latter condition may be of great importance when, as at Chlum, sufficient force is not at hand, in order to be in readiness to repulse the enemy's reserves.

Should the defender have succeeded in occupying a position which confines or excludes the co-operation of the assailant's artillery, then it becomes essential for the latter to gain possession of a point in the enemy's position which will allow of a numerous artillery being placed there. The assailant will now in his turn be in a position to enjoy the advantages of the defence, as he can defend himself against the attacks of the enemy's reserves. The continuation of the offensive later on is not excluded thereby (Vionville). In rencontre fights, this will be the object of the first stubborn engagements.

Where, owing to circumstances, a frontal fight is necessary, further where the *terrain* excludes the possibility of obtaining much effect from the artillery, but where a rapid decision is most desirable, the whole onus of the fighting at close quarters falls upon the infantry—the foregoing method cannot be carried out without further assistance. An eventual destruction of the opponent must ensue—in accordance with the peculiarity of infantry fighting which can only gain ground by successive and strenuous exertions. A concentration of forces against the point of attack is here also demanded. The advantages which a better training and higher fighting discipline, as well as increased intelligence amongst the lower ranks, but above all the higher moral bearing of the troops, confer, receive here their highest value, in order that the enemy's numerically superior forces may be advantageously attacked by inferior numbers, thereby enabling troops

which are intact to be kept in hand for the decision. The artillery will take part hereby as numerically strong as the ground will allow.

Those fights of the manœuvre battle, which are intended to divert the enemy's attention, belong to this category, in addition to combats of the advanced and rear guards. The characteristic of these fights is the small stake at issue, and the gradual absorption of the enemy's reserves, while in the manœuvre battle it is the greater stake which is first at issue, and the more rapid decision which may be said to prescribe it. It should be the object of the officer who is responsible for the conduct of the battle, to draw off the enemy's reserves from the point of attack, or else to prevent them from making an immediate counter-stroke, so that he may be immediately able to secure himself in the position which has been won.

APPENDIX.

INSTRUCTIONS OF FREDERICK II. TO HIS ARTILLERY COLONELS VON DIESKAU AND MOLLER, ISSUED IN THE CAMP AT PROSNITZ, BY OLMÜTZ, 30TH JUNE, 1758.

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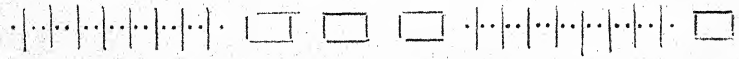

Should it be the left wing which is to attack, then only what is here on the right hand is to be placed on the left; the great battery must be always in front of the army. The remaining guns are to be used on that flank which does not attack; the seven-pounder howitzers must go with those ten battalions which take part in the attack. The gunners must keep up a steady fire in order to dismount the enemy's guns, and when they have silenced them they must fire at the cavalry as well as infantry and take them *en echarpe* or else obliquely in the flanks. The batteries are to be brought up steadily to the front as at Leuthen, and the big one of forty guns can especially produce the most astounding effect if the gunners shoot straight and commence to fire at 800

paces with case. The twenty guns which are on the wing which does not attack, can also at last come up, and produce a very great effect in order to utterly rout the enemy and make the victory easier for our people.

(Signed) FREDERICK.

THE END.

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